

APPLICATION CERTIFICATION FCC Part 15C  
On Behalf of  
Shenzhen Kinlan Technology Company Limited

True Wireless Earbuds

Model No.: BE1028

FCC ID: 2AE3CBE1028

Prepared for : Shenzhen Kinlan Technology Company Limited  
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Report No. : ATE20191376  
Date of Test : September 17-20, 2019  
Date of Report : September 24, 2019

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## Test Report Certification

Applicant : Shenzhen Kinlan Technology Company Limited  
Manufacturer : Shenzhen Kinlan Technology Company Limited  
EUT : True Wireless Earbuds  
Model No. : BE1028

Measurement Procedure Used:

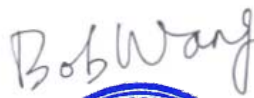
**FCC Rules and Regulations Part 15 Subpart C Section 15.247  
ANSI C63.10: 2013**

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 : September 17-20, 2019  
Date of Report : September 24, 2019

Test Engineer :   
(Ben, Engineer)

Prepared by :   
(Bob Wang, Engineer)

Approved & Authorized Signer :   
(Sean Liu, Manager)



## 1. GENERAL INFORMATION

### 1.1. Description of Device (EUT)

|                    |   |                                                                                                                             |
|--------------------|---|-----------------------------------------------------------------------------------------------------------------------------|
| Model Number       | : | BE1028                                                                                                                      |
| Bluetooth version  | : | V5.0                                                                                                                        |
| Frequency Range    | : | 2402MHz-2480MHz                                                                                                             |
| Number of Channels | : | 79                                                                                                                          |
| Antenna Gain(Max)  | : | 0dBi                                                                                                                        |
| Antenna type       | : | Integral Antenna                                                                                                            |
| Modulation mode    | : | GFSK, $\pi/4$ DQPSK, 8DPSK                                                                                                  |
| Hardware version   | : | L0                                                                                                                          |
| Software version   | : | 2.1                                                                                                                         |
| Power Supply       | : | DC 3.7V (Powered by Lithium battery) or<br>DC 5.0V (Powered by USB port)                                                    |
| Applicant          | : | Shenzhen Kinlan Technology Company Limited                                                                                  |
| Address            | : | West of 3F, Building A4, Yinlong Industrial Park, No.292<br>Shenshan Road, Longgang District, Shenzhen, Guangdong,<br>China |
| Manufacturer       | : | Shenzhen Kinlan Technology Company Limited                                                                                  |
| Address            | : | No.12, Shunxing Fifth Road, Dajingtou Second Industrial<br>Zone, Dalang Town, Dongguan City, Guangdong, China               |

### 1.2. Accessory and Auxiliary Equipment

|                                                 |   |                                                      |
|-------------------------------------------------|---|------------------------------------------------------|
| AC/DC Power Adapter<br>(provided by laboratory) | : | Model:BEK-QC-001<br>INPUT: 120V~60Hz<br>OUTPUT:5V/1A |
|-------------------------------------------------|---|------------------------------------------------------|

### 1.3. Description of Test Facility

|               |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EMC Lab       | : | Recognition of accreditation by Federal Communications Commission (FCC)<br>The Designation Number is CN1189<br>The Registration Number is 708358<br><br>Listed by Innovation, Science and Economic Development Canada (ISED)<br>The Registration Number is 5077A-2<br><br>Accredited by China National Accreditation Service for Conformity Assessment (CNAS)<br>The Registration Number is CNAS L3193<br><br>Accredited by American Association for Laboratory Accreditation (A2LA)<br>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                                                                                                                                                                                                                                                                                                                                                                                                 |

### 1.4. 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 |
| Conduction Emission Expanded Uncertainty (Telecommunication ports, 150kHz-30MHz) | : | U=2.94dB, k=2 |
| Power disturbance Expanded Uncertainty                                           | : | U=2.92dB, k=2 |
| Harmonic current expanded uncertainty                                            | : | U=0.512%, k=2 |

## 2. MEASURING DEVICE AND TEST EQUIPMENT

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

| Kind of equipment           | Manufacturer           | Type                               | S/N       | Calibrated dates | Calibrated until |
|-----------------------------|------------------------|------------------------------------|-----------|------------------|------------------|
| EMI Test Receiver           | Rohde&Schwarz          | ESCS30                             | 100307    | Jan. 05, 2019    | 1 Year           |
| EMI Test Receiver           | Rohde& Schwarz         | ESR                                | 101817    | Jan. 05, 2019    | 1 Year           |
| Spectrum Analyzer           | Rohde&Schwarz          | FSV40                              | 101495    | Jan. 05, 2019    | 1 Year           |
| Pre-Amplifier               | Rohde&Schwarz          | CBLU1183540-01                     | 3791      | Jan. 05, 2019    | 1 Year           |
| Loop Antenna                | Schwarzbeck            | FMZB1516                           | 1516131   | Jan. 05, 2019    | 1 Year           |
| Bilog Antenna               | Schwarzbeck            | VULB9163                           | 9163-323  | Jan. 05, 2019    | 1 Year           |
| Horn Antenna                | Schwarzbeck            | BBHA9120D                          | 9120D-655 | Jan. 05, 2019    | 1 Year           |
| Horn Antenna                | Schwarzbeck            | BBHA9170                           | 9170-359  | Jan. 05, 2019    | 1 Year           |
| LISN                        | Schwarzbeck            | NSLK8126                           | 8126431   | Jan. 05, 2019    | 1 Year           |
| Highpass Filter             | Wainwright Instruments | WHKX3.6/18G-10S S                  | N/A       | Jan. 05, 2019    | 1 Year           |
| Band Reject Filter          | Wainwright Instruments | WRCG2400/2485-2 375/2510-60/11SS   | N/A       | Jan. 05, 2019    | 1 Year           |
| RF COAXIAL CABLE            | SUHNER                 | N-5m(Frequency range:9KHz-26.5GHz) | NO.3      | Jan. 05, 2019    | 1 Year           |
| RF COAXIAL CABLE            | SUHNER                 | N-5m(Frequency range:9KHz-26.5GHz) | NO.4      | Jan. 05, 2019    | 1 Year           |
| RF COAXIAL CABLE            | SUHNER                 | N-1m(Frequency range:9KHz-26.5GHz) | NO.5      | Jan. 05, 2019    | 1 Year           |
| RF COAXIAL CABLE            | SUHNER                 | N-1m(Frequency range:9KHz-26.5GHz) | NO.6      | Jan. 05, 2019    | 1 Year           |
| Temporary antenna connector | NTGS                   | 14AE                               | N/A       | Jan. 21, 2019    | N/A              |

Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

### 3. OPERATION OF EUT DURING TESTING

#### 3.1.Operating Mode

The mode is used: Transmitting mode

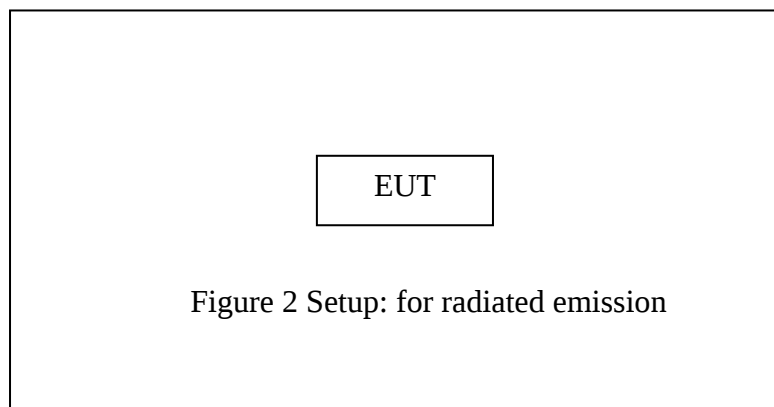
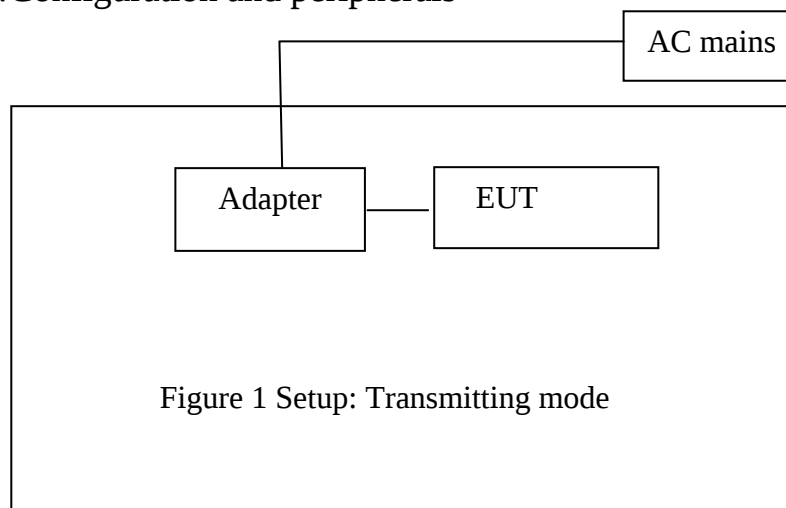
Low Channel: 2402MHz

Middle Channel: 2441MHz

High Channel: 2480MHz

Hopping

#### 3.2.Configuration and peripherals



## 4. FREQUENCY HOPPING SYSTEM REQUIREMENTS

### 4.1. Standard and Limit

According to FCC Part 15.247(a)(1), 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.

(g) Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. However, the system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this section should the transmitter be presented with a continuous data (or information) stream. In addition, a system employing short transmission bursts must comply with the definition of a frequency hopping system and must distribute its transmissions over the minimum number of hopping channels specified in this section.

(h) The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hop sets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

### 4.2. EUT Pseudorandom Frequency Hopping Sequence

Pseudorandom Frequency Hopping Sequence Table as below:

Channel: 08, 24, 40, 56, 34, 51, 72, 09, 01, 64, 22, 33, 41, 32, 47, 65, 73, 53, 69, 06, 17, 04, 20, 36, 52, 38, 66, 70, 78, 68, 76, 21, 29, 10, 26, 49, 00, 58, 44, 59, 75, 13, 03, 14, 11, 35, 43, 37, 50, 61, 77, 55, 71, 02, 23, 07, 27, 39, 54, 46, 48, 15, 63, 62, 67, 25, 31, 12, 28, 19, 60, 42, 57, 74, 16, 05, 18, 30, 45, etc.

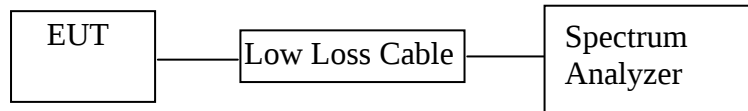
The system receiving have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.

## 5. TEST PROCEDURES AND RESULTS

| FCC Rules                           | Description of Test                    | Result    |
|-------------------------------------|----------------------------------------|-----------|
| 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 Emissions Test | Compliant |
| Section 15.203                      | Antenna Requirement                    | Compliant |

## 6. 20DB BANDWIDTH TEST

### 6.1. Block Diagram of Test Setup



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

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.

### 6.3. EUT Configuration on Measurement

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

### 6.4. Operating Condition of EUT

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

6.4.2. Turn on the power of all equipment.

6.4.3. Let the EUT work in TX (Hopping off) 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 30 kHz and VBW to 100 kHz.

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

## 6.6. Test Result

Test Lab: Shielding room

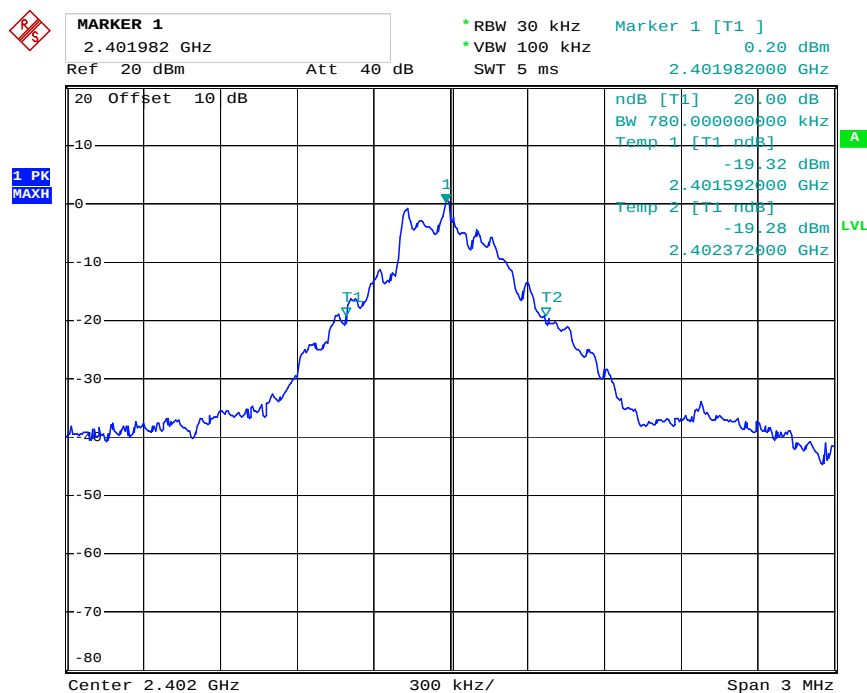
Test Engineer: Ben

| Channel | Frequency (MHz) | GFSK 20dB Bandwidth (MHz) | Π/4-DQPSK 20dB Bandwidth (MHz) | 8DPSK 20dB Bandwidth (MHz) | Result |
|---------|-----------------|---------------------------|--------------------------------|----------------------------|--------|
| Low     | 2402            | 0.780                     | 1.272                          | 1.230                      | Pass   |
| Middle  | 2441            | 0.792                     | 1.260                          | 1.236                      | Pass   |
| High    | 2480            | 0.798                     | 1.242                          | 1.224                      | Pass   |

The spectrum analyzer plots are attached as below.

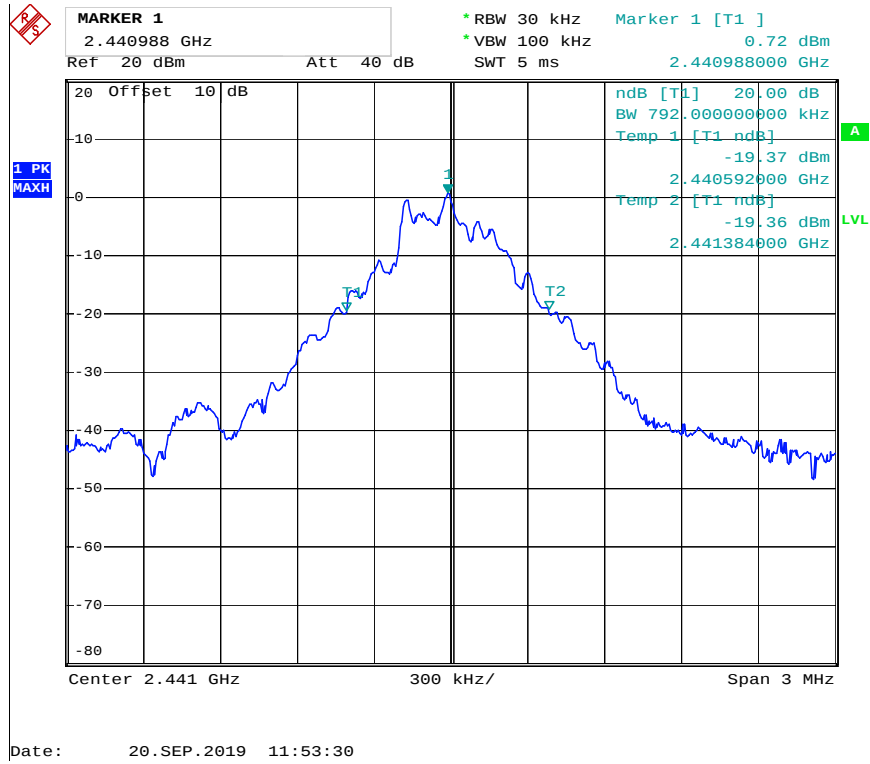
### GFSK Mode

#### Low channel

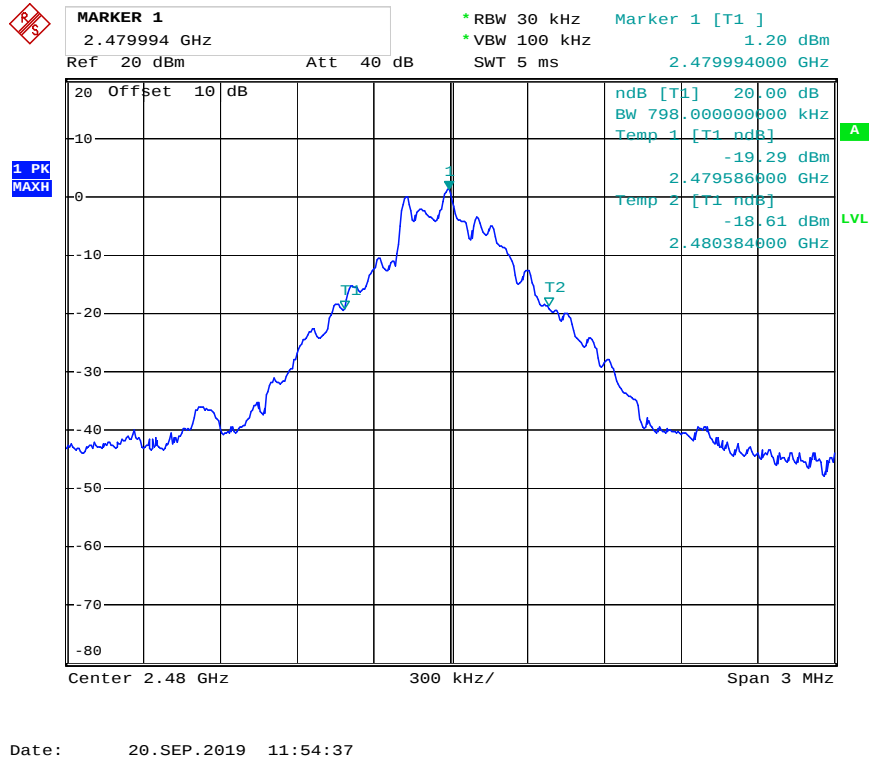


Date: 20.SEP.2019 11:52:12

## Middle channel

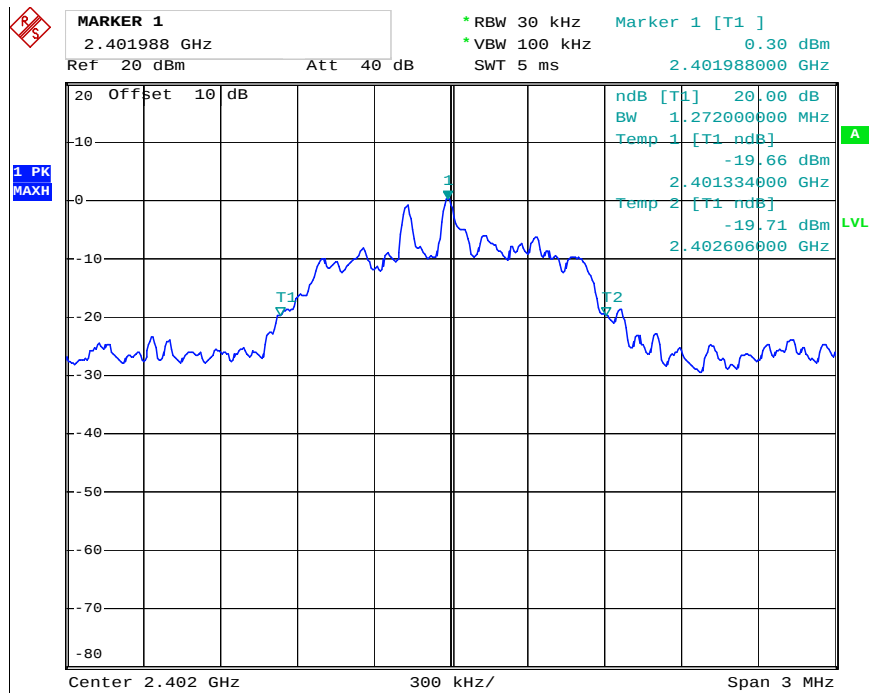


## High channel



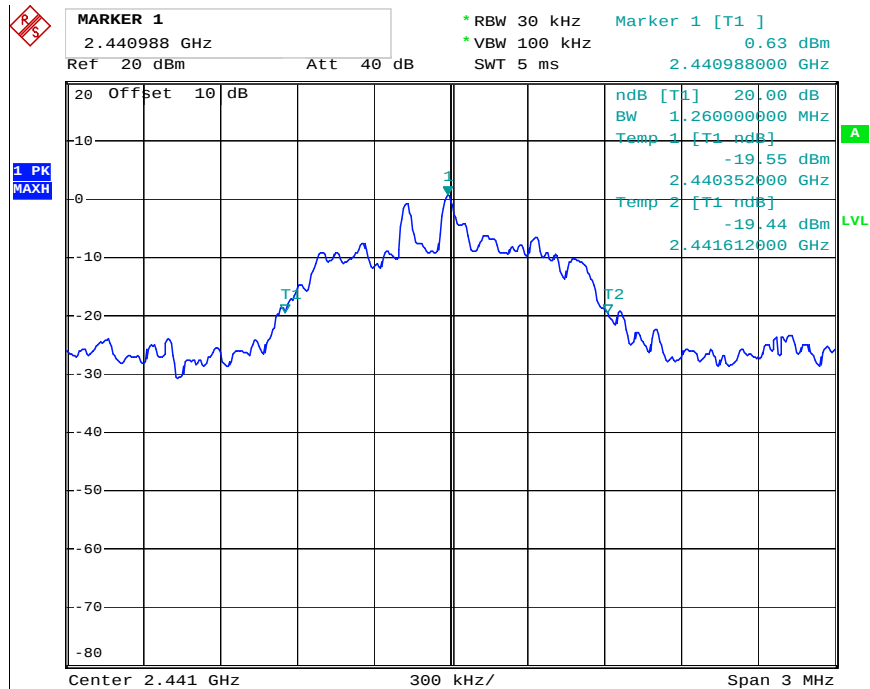
## Π/4-DQPSK Mode

### Low channel



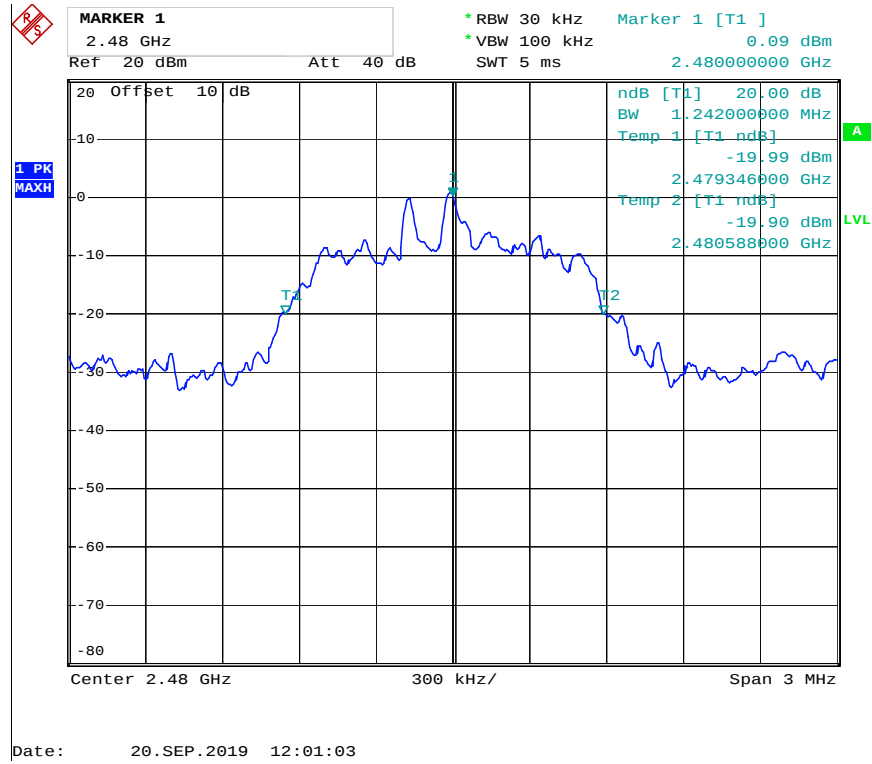
Date: 20.SEP.2019 11:55:29

### Middle channel



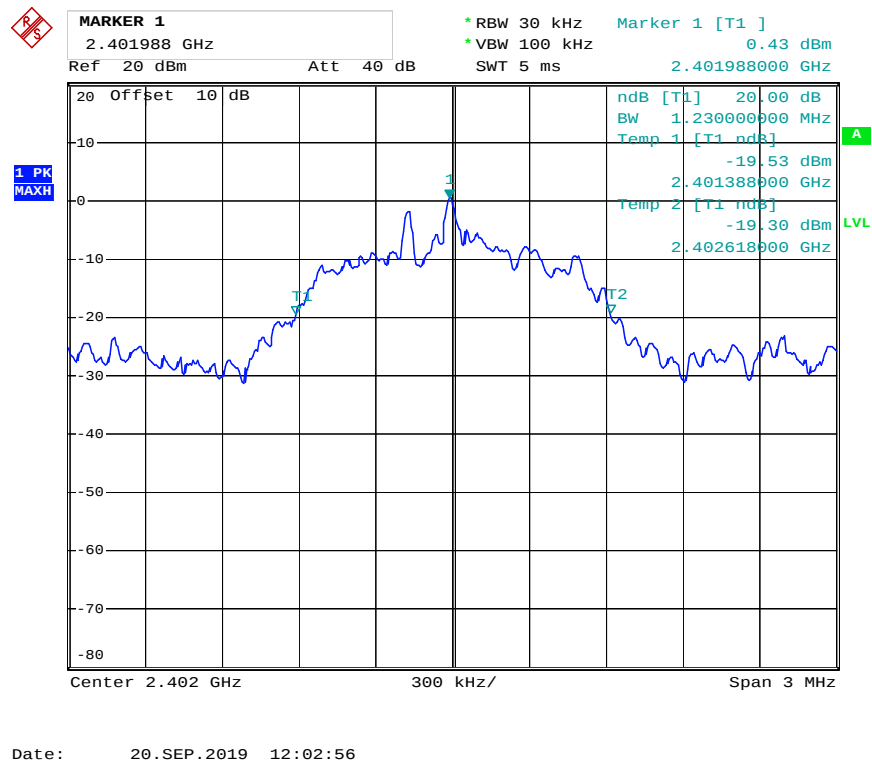
Date: 20.SEP.2019 11:56:22

## High channel

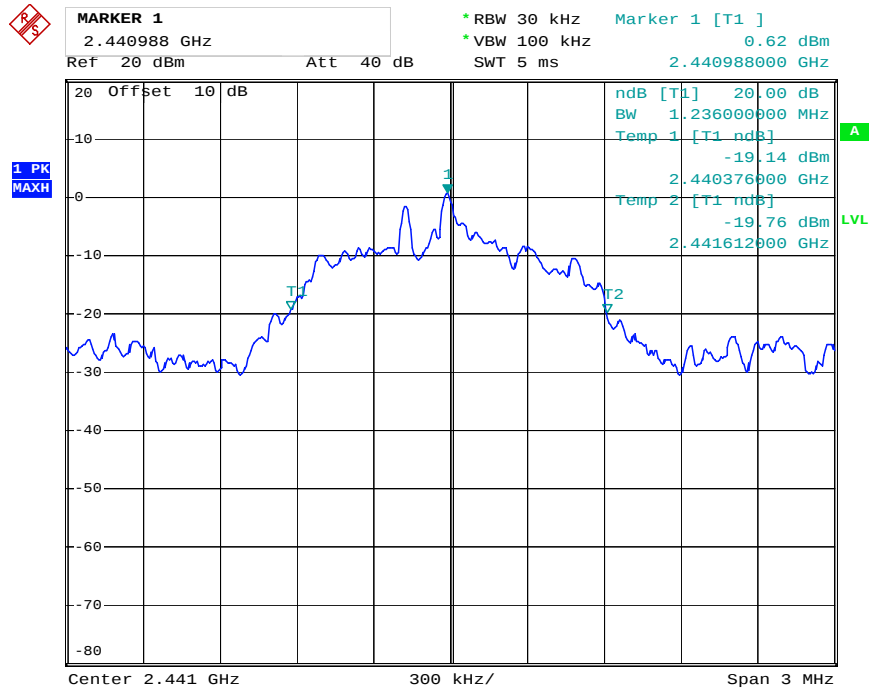


## 8DPSK Mode

## Low channel

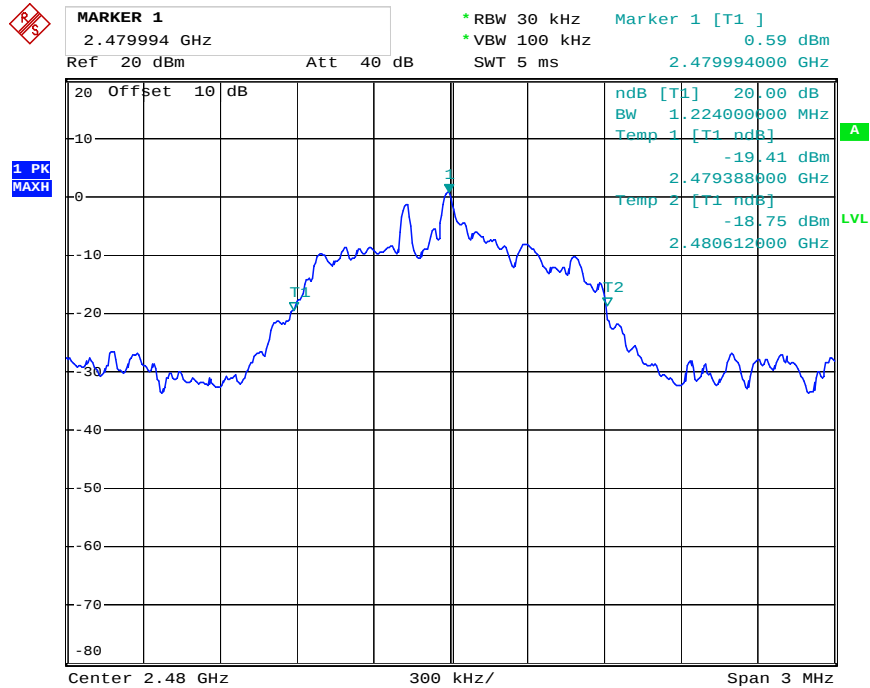


## Middle channel



Date: 20.SEP.2019 12:03:32

## High channel



Date: 20.SEP.2019 12:02:22

## 7. CARRIER FREQUENCY SEPARATION TEST

### 7.1. Block Diagram of Test Setup



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

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.

### 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 6.1.

7.4.2. Turn on the power of all equipment.

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

## 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 RBW of spectrum analyzer to 30 kHz and VBW to 100 kHz. Adjust Span to 3 MHz.

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

7.5.4. Measurement the channel separation

## 7.6. Test Result

Test Lab: Shielding room

Test Engineer: Ben

### GFSK

| Channel | Frequency (MHz) | Channel Separation(MHz) | Limit (MHz)                 | Result |
|---------|-----------------|-------------------------|-----------------------------|--------|
| Low     | 2402            | 1.008                   | 25KHz or 2/3*20dB bandwidth | Pass   |
|         | 2403            |                         |                             |        |
| Middle  | 2440            | 1.002                   | 25KHz or 2/3*20dB bandwidth | Pass   |
|         | 2441            |                         |                             |        |
| High    | 2479            | 1.008                   | 25KHz or 2/3*20dB bandwidth | Pass   |
|         | 2480            |                         |                             |        |

### Π/4-DQPSK

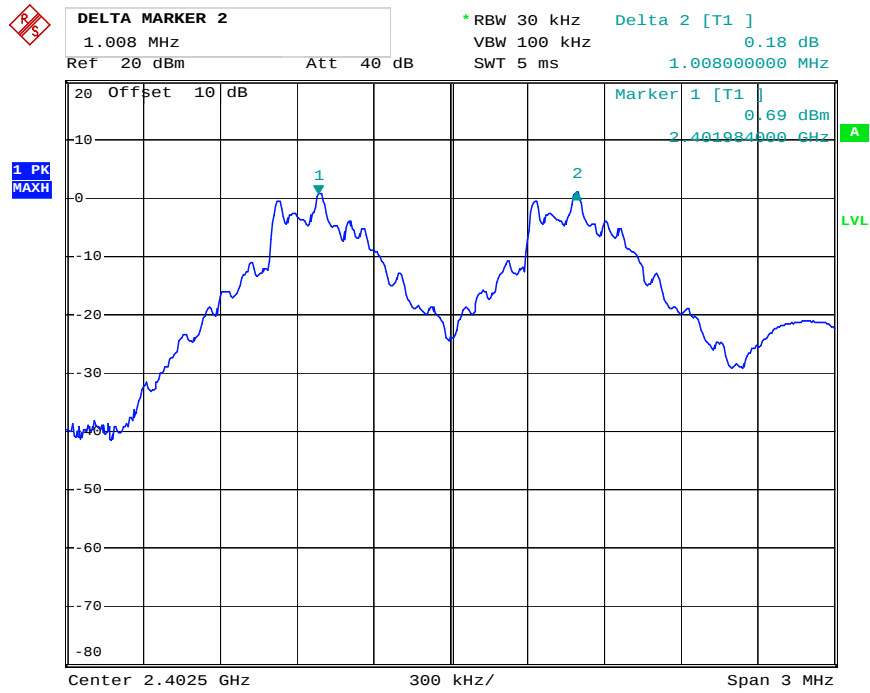
| Channel | Frequency (MHz) | Channel Separation(MHz) | Limit (MHz)                 | Result |
|---------|-----------------|-------------------------|-----------------------------|--------|
| Low     | 2402            | 1.002                   | 25KHz or 2/3*20dB bandwidth | Pass   |
|         | 2403            |                         |                             |        |
| Middle  | 2440            | 1.002                   | 25KHz or 2/3*20dB bandwidth | Pass   |
|         | 2441            |                         |                             |        |
| High    | 2479            | 1.002                   | 25KHz or 2/3*20dB bandwidth | Pass   |
|         | 2480            |                         |                             |        |

### 8DPSK

| Channel | Frequency (MHz) | Channel Separation(MHz) | Limit (MHz)                 | Result |
|---------|-----------------|-------------------------|-----------------------------|--------|
| Low     | 2402            | 1.002                   | 25KHz or 2/3*20dB bandwidth | Pass   |
|         | 2403            |                         |                             |        |
| Middle  | 2440            | 1.002                   | 25KHz or 2/3*20dB bandwidth | Pass   |
|         | 2441            |                         |                             |        |
| High    | 2479            | 1.002                   | 25KHz or 2/3*20dB bandwidth | Pass   |
|         | 2480            |                         |                             |        |

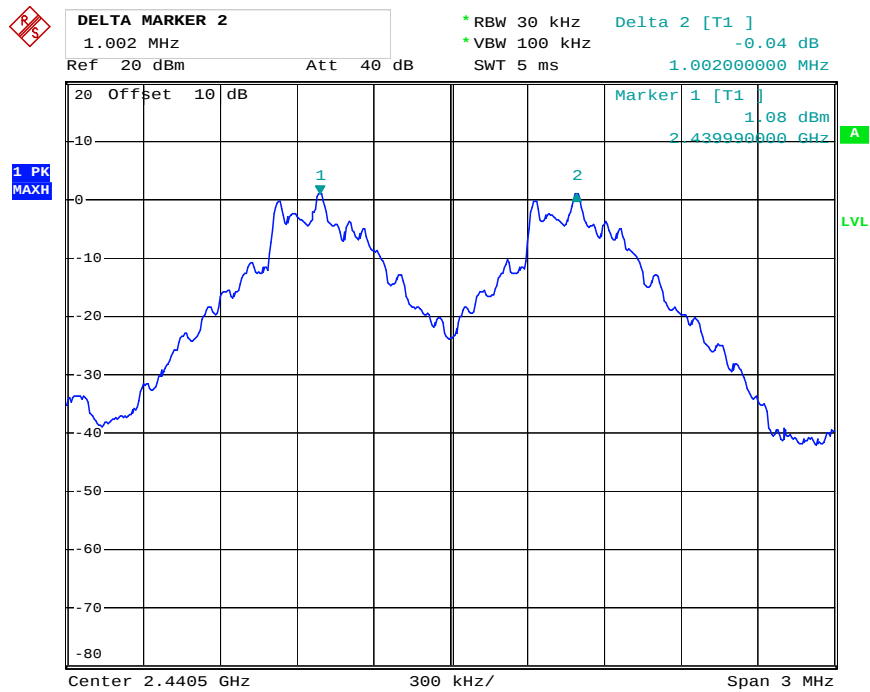
## GFSK Mode

### Low channel



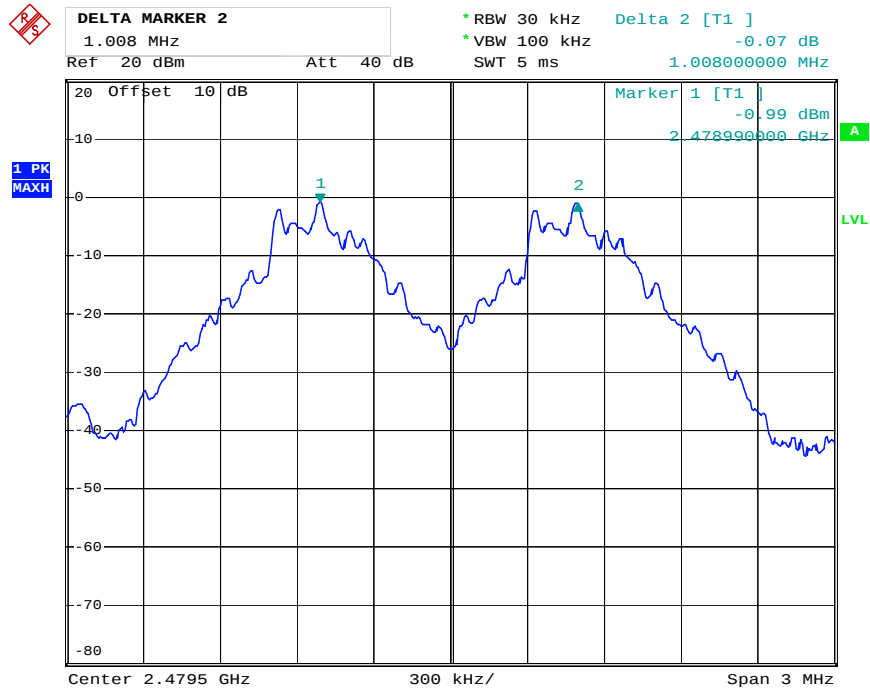
Date: 20.SEP.2019 15:32:03

### Middle channel



Date: 20.SEP.2019 14:29:07

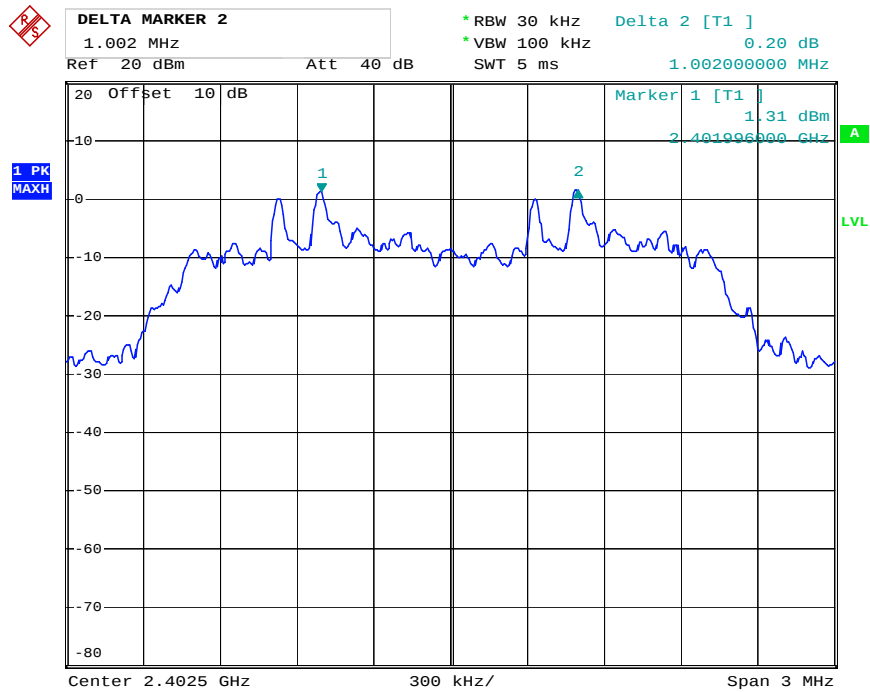
## High channel



Date: 20.SEP.2019 14:30:15

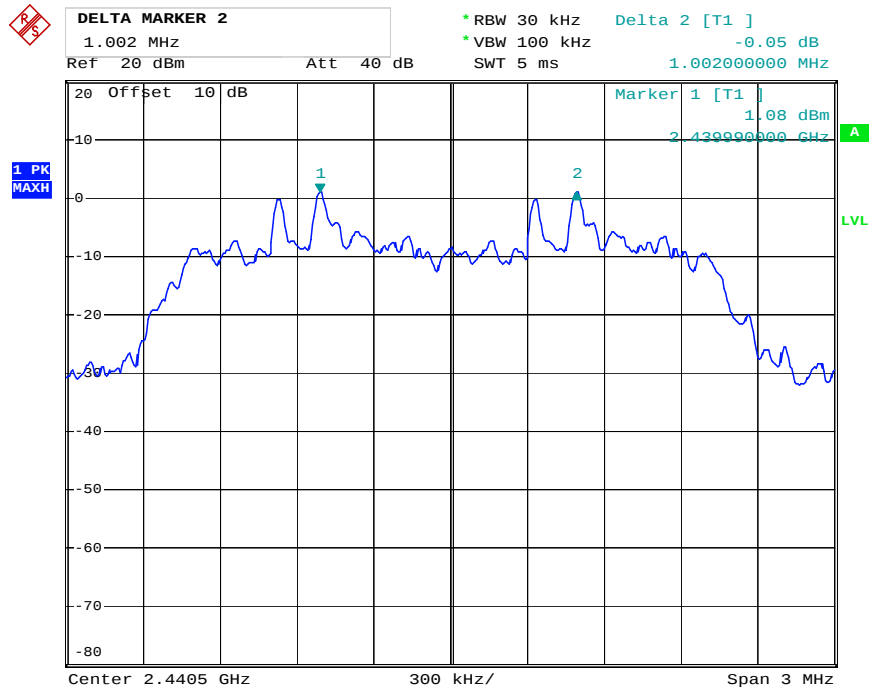
## Π/4-DQPSK Mode

## Low channel



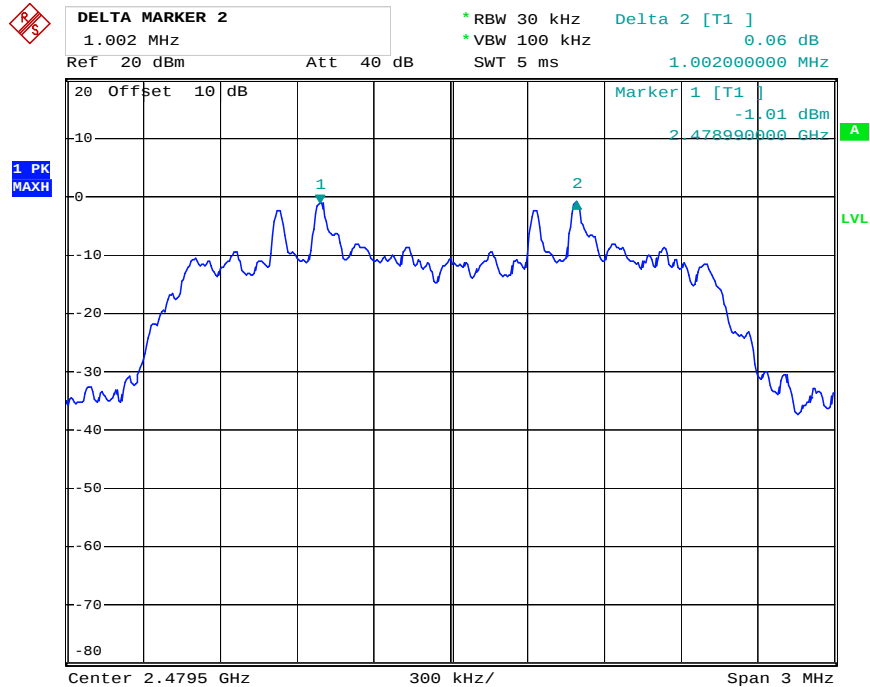
Date: 20.SEP.2019 14:33:21

## Middle channel



Date: 20.SEP.2019 14:32:23

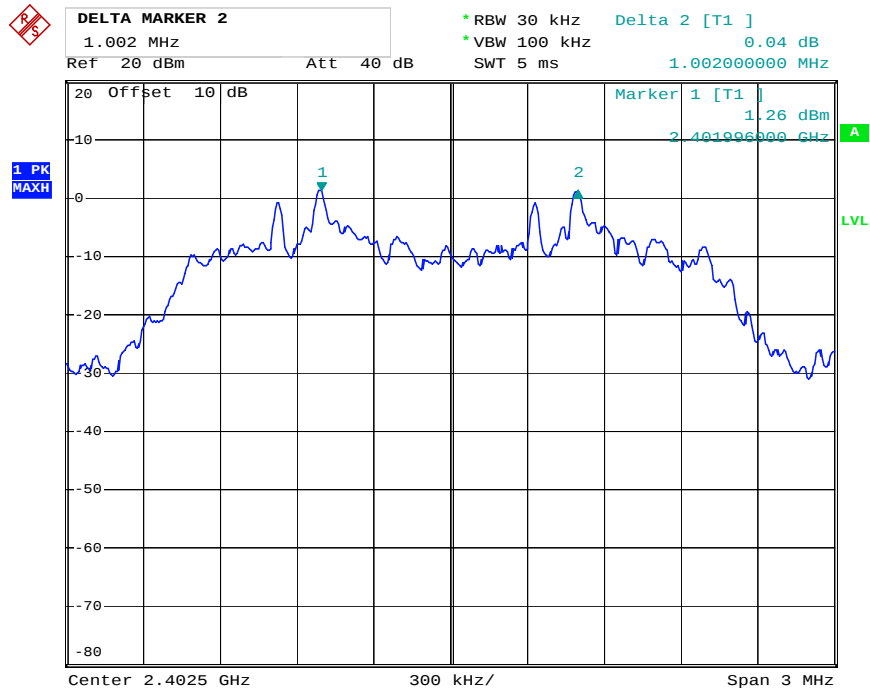
## High channel



Date: 20.SEP.2019 14:31:13

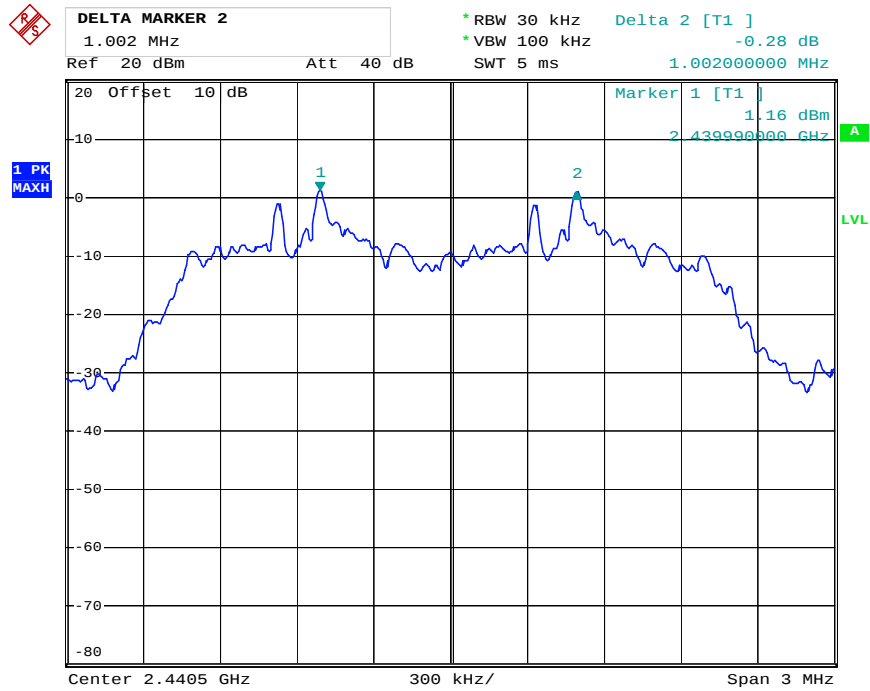
## 8DPSK Mode

### Low channel



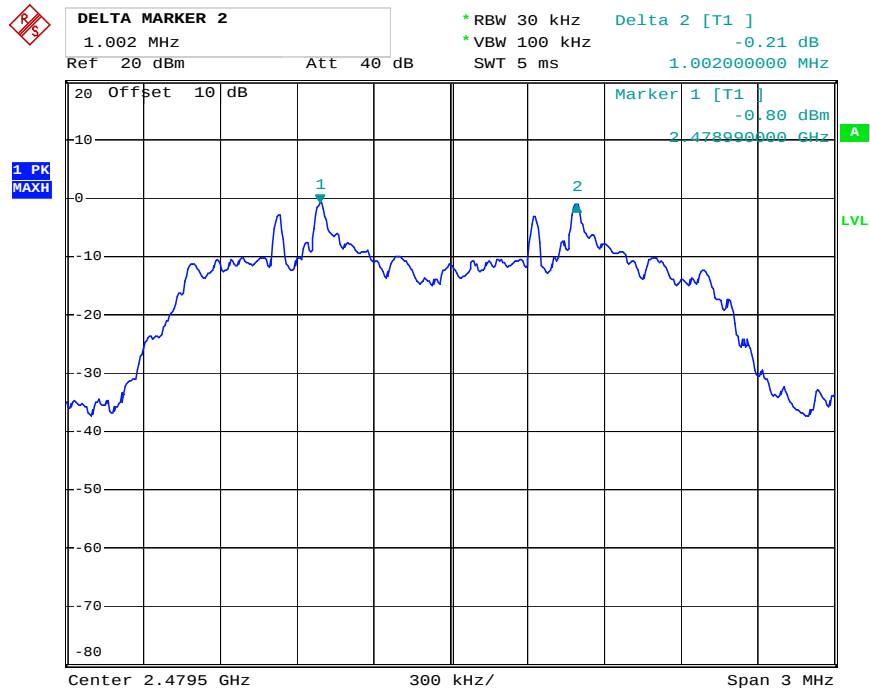
Date: 20.SEP.2019 14:34:28

### Middle channel



Date: 20.SEP.2019 14:35:39

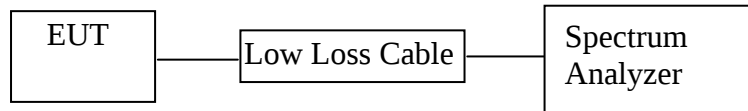
# High channel



Date: 20.SEP.2019 14:36:46

## 8. NUMBER OF HOPPING FREQUENCY TEST

### 8.1. Block Diagram of Test Setup



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

Section 15.247(a)(1)(iii): Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

### 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 7.1.

8.4.2. Turn on the power of all equipment.

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

### 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 the spectrum analyzer as RBW=100 kHz, VBW=300 kHz.

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

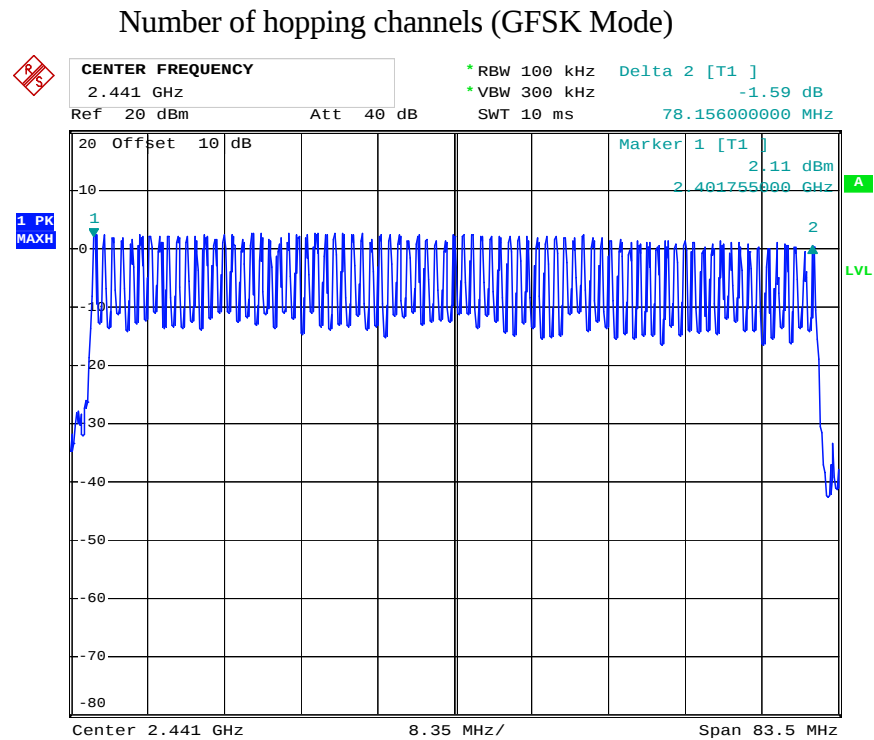
## 8.6.Test Result

Test Lab: Shielding room

Test Engineer: Ben

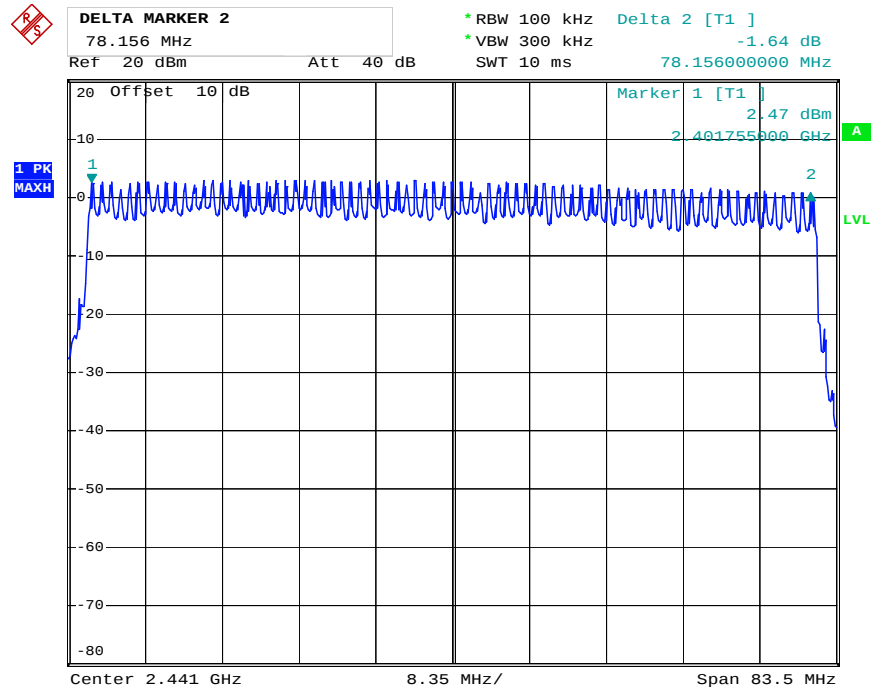
| Total number of hopping channel | Measurement result(CH) | Limit(CH) | Result |
|---------------------------------|------------------------|-----------|--------|
|                                 | 79                     | $\geq 15$ | Pass   |

The spectrum analyzer plots are attached as below.



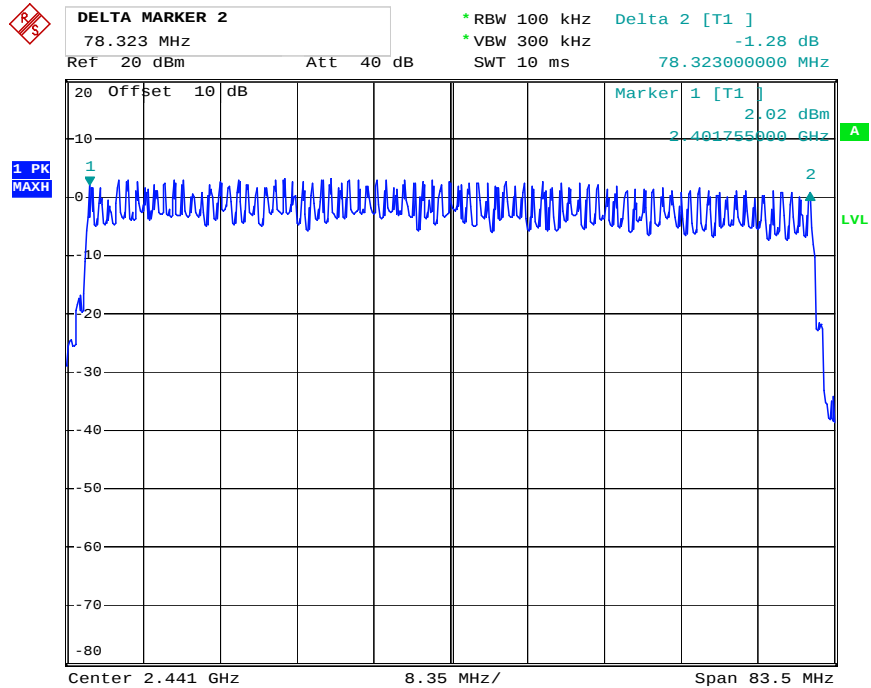
Date: 20.SEP.2019 13:48:12

## Number of hopping channels ( $\Pi/4$ -DQPSK Mode)



Date: 20.SEP.2019 13:52:08

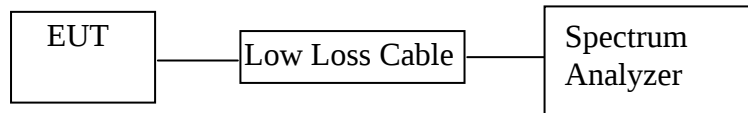
## Number of hopping channels (8DPSK Mode)



Date: 20.SEP.2019 13:54:33

## 9. DWELL TIME TEST

### 9.1. Block Diagram of Test Setup



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

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.

### 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 8.1.

9.4.2. Turn on the power of all equipment.

9.4.3. 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.

### 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 center frequency of spectrum analyzer = operating frequency.

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

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

## 9.6. Test Result

Test Lab: Shielding room

Test Engineer: Ben

### GFSK Mode (Worse case)

| Mode                                                                                                              | Channel Frequency (MHz) | Pulse Time (ms) | Dwell Time (ms) | Limit (ms) |
|-------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------|-----------------|------------|
| DH1                                                                                                               | 2441                    | 0.42            | 134.4           | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$ |                         |                 |                 |            |
| DH3                                                                                                               | 2441                    | 1.70            | 272.0           | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$ |                         |                 |                 |            |
| DH5                                                                                                               | 2441                    | 2.99            | 319.0           | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$ |                         |                 |                 |            |

### $\Pi/4$ -DQPSK (Worse case)

| Mode                                                                                                              | Channel Frequency (MHz) | Pulse Time (ms) | Dwell Time (ms) | Limit (ms) |
|-------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------|-----------------|------------|
| DH1                                                                                                               | 2441                    | 0.43            | 137.6           | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$ |                         |                 |                 |            |
| DH3                                                                                                               | 2441                    | 1.73            | 276.8           | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$ |                         |                 |                 |            |
| DH5                                                                                                               | 2441                    | 2.96            | 315.7           | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$ |                         |                 |                 |            |

### 8DPSK Mode (Worse case)

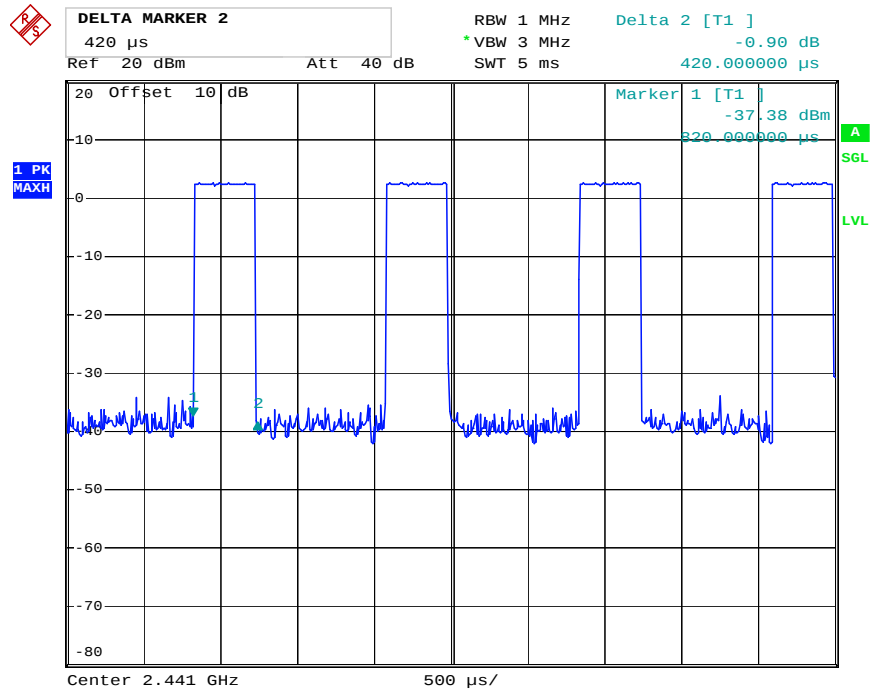
| Mode                                                                                                              | Channel Frequency (MHz) | Pulse Time (ms) | Dwell Time (ms) | Limit (ms) |
|-------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------|-----------------|------------|
| DH1                                                                                                               | 2441                    | 0.43            | 137.6           | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$ |                         |                 |                 |            |
| DH3                                                                                                               | 2441                    | 1.70            | 272.0           | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$ |                         |                 |                 |            |
| DH5                                                                                                               | 2441                    | 2.96            | 315.7           | 400        |
| A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$ |                         |                 |                 |            |

Note: We tested GFSK mode and  $\Pi/4$ -DQPSK & 8DPSK mode the low, middle and high channel and recorded the Worse case data for all test mode.

The spectrum analyzer plots are attached as below.

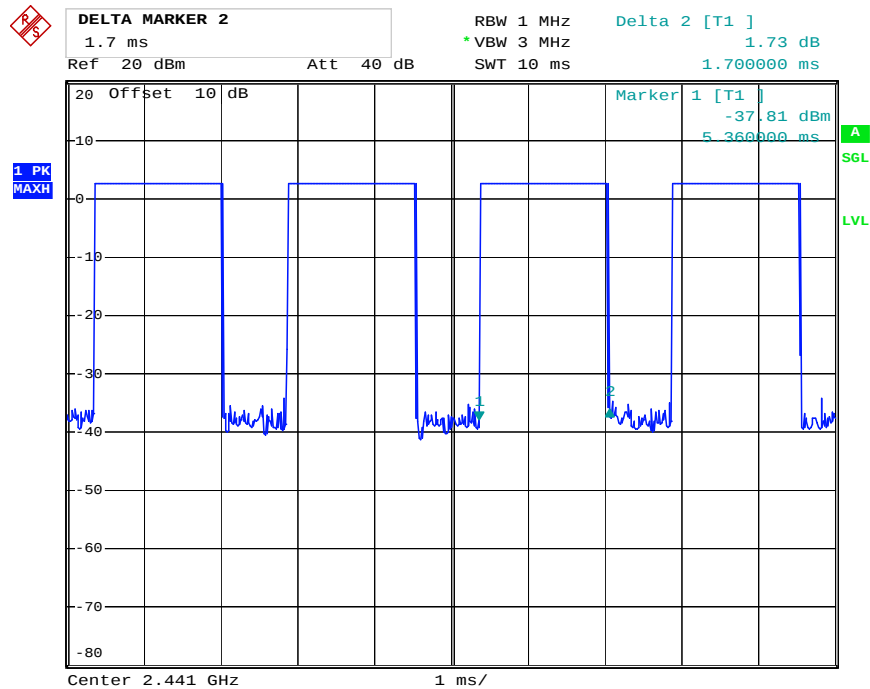
## GFSK Mode

### DH1 Middle channel



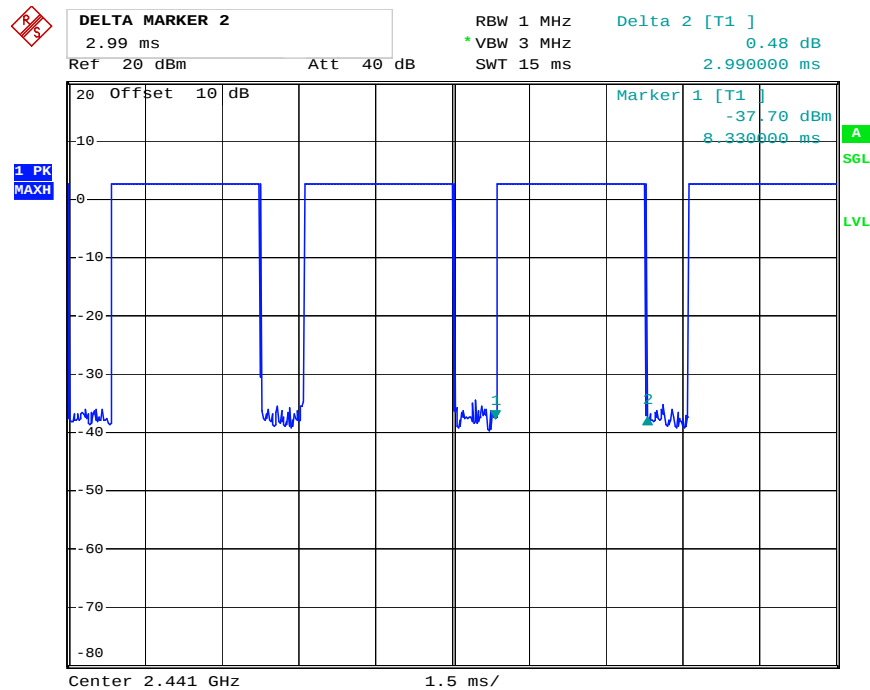
Date: 20.SEP.2019 13:56:19

### DH3 Middle channel



Date: 20.SEP.2019 13:57:54

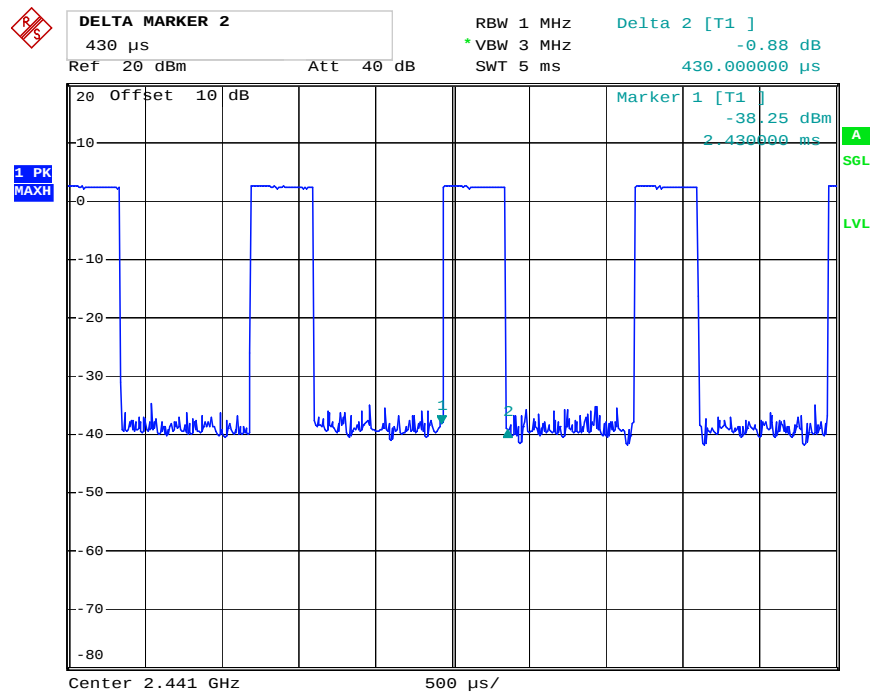
## DH5 Middle channel



Date: 20.SEP.2019 13:58:45

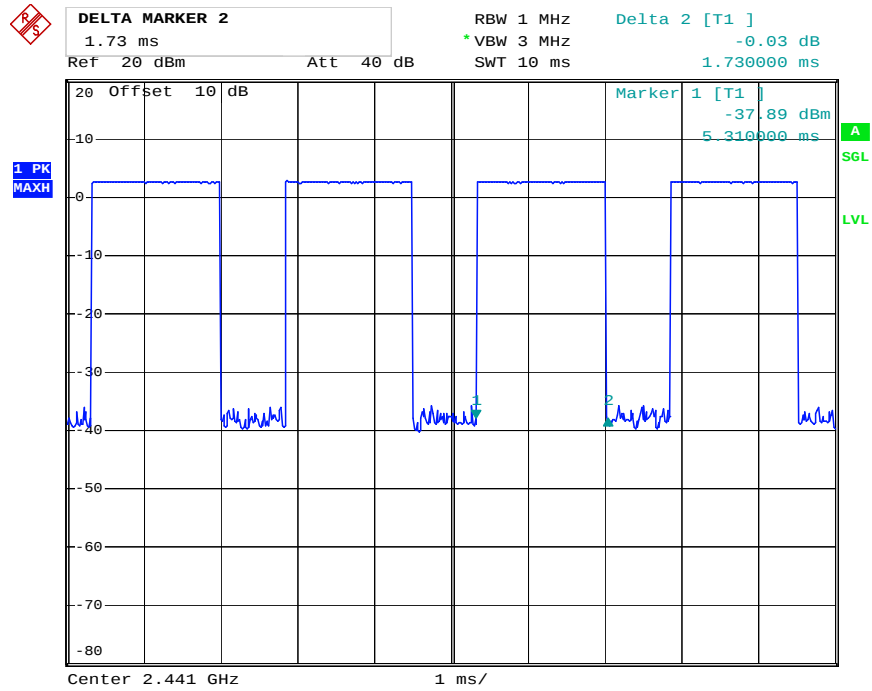
## Π/4-DQPSK Mode

## 2DH1 Middle channel



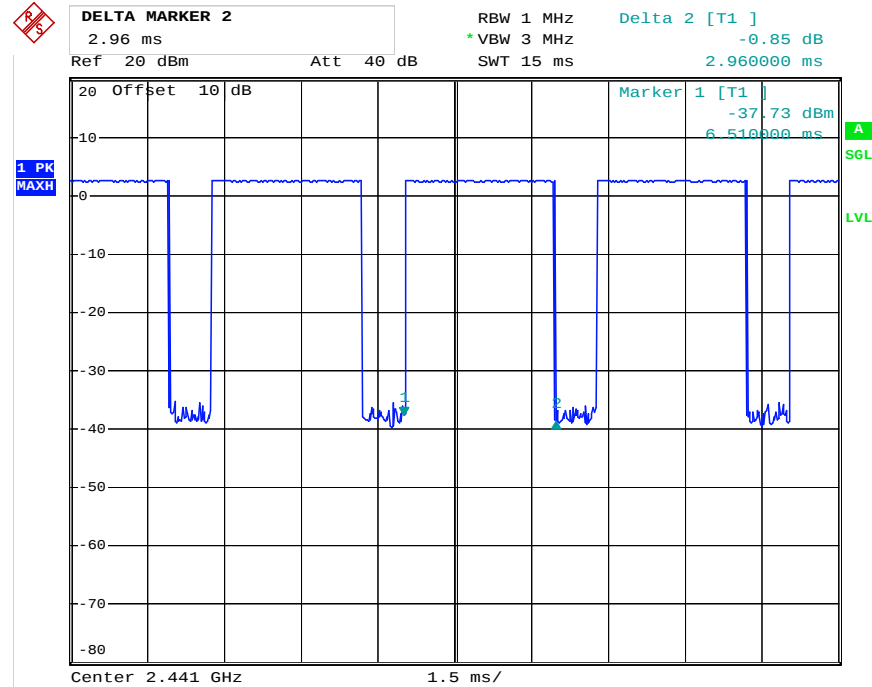
Date: 20.SEP.2019 13:59:34

## 2DH3 Middle channel



Date: 20.SEP.2019 14:00:34

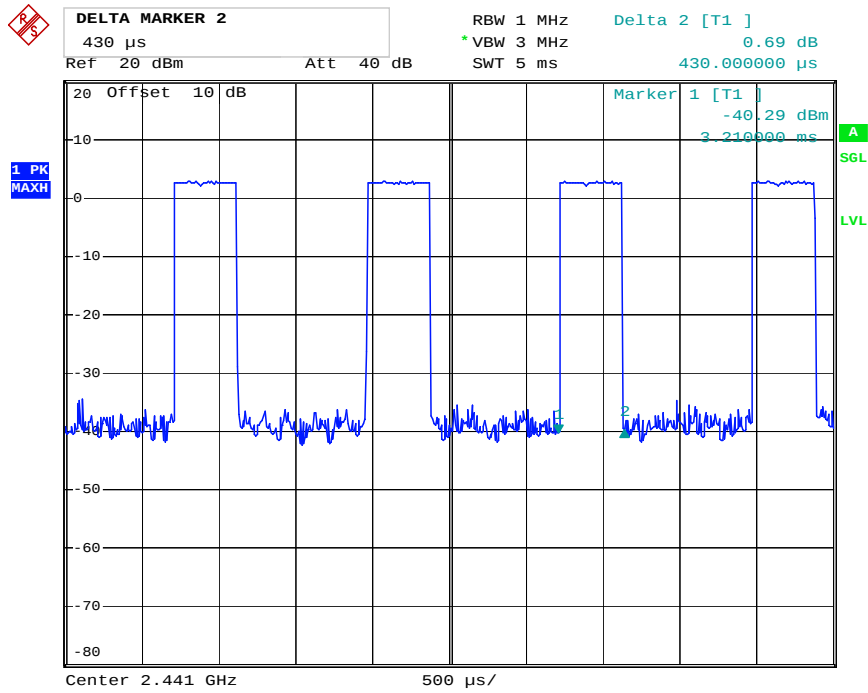
## 2DH5 Middle channel



Date: 26.JUN.2019 18:36:54  
 Date: 20.SEP.2019 14:01:15

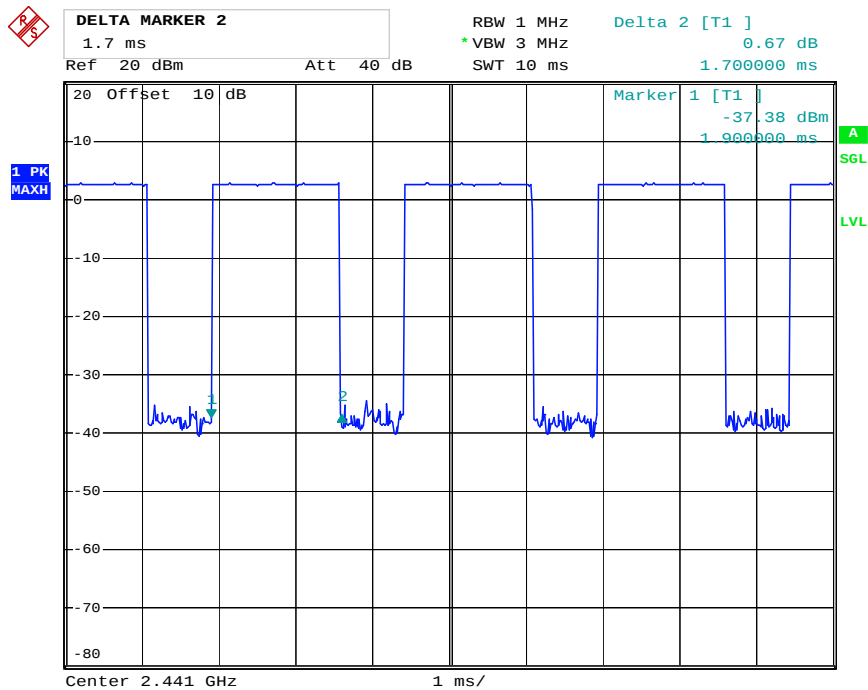
## 8DPSK Mode

### 3DH1 Middle channel



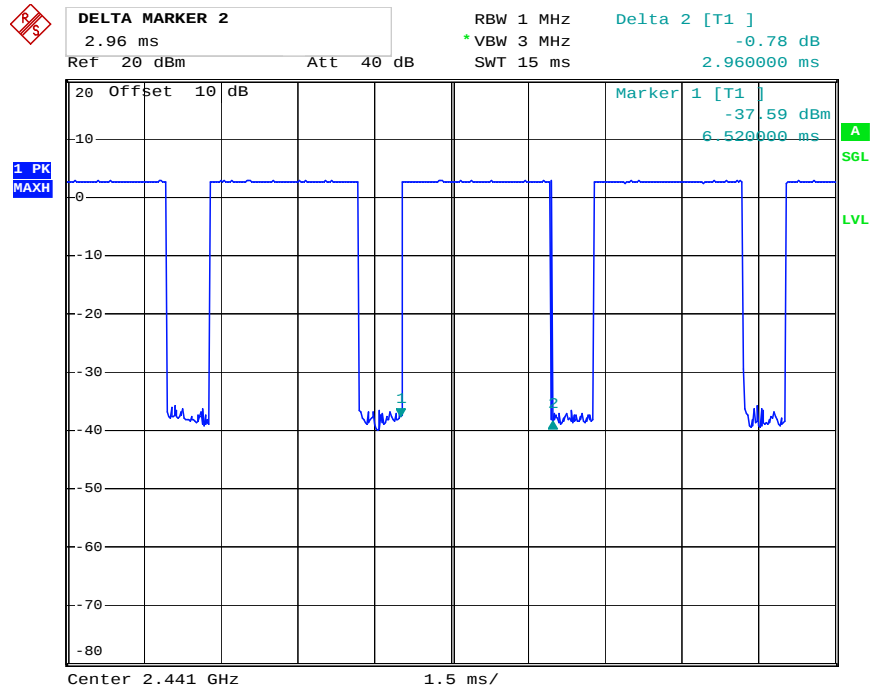
Date: 20.SEP.2019 14:02:04

### 3DH3 Middle channel



Date: 20.SEP.2019 14:03:06

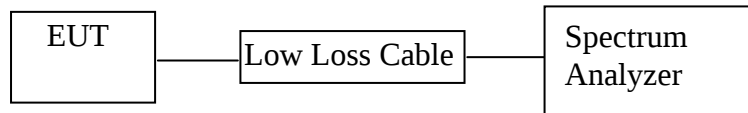
### 3DH5 Middle channel



Date: 20.SEP.2019 14:03:57

## 10. MAXIMUM PEAK OUTPUT POWER TEST

### 10.1. Block Diagram of Test Setup



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

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.

### 10.3. 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.

### 10.4. Operating Condition of EUT

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

10.4.2. Turn on the power of all equipment.

10.4.3. 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.

### 10.5. Test Procedure

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

10.5.2. Set RBW of spectrum analyzer to 3MHz and VBW to 10MHz.

10.5.3. Measurement the maximum peak output power.

## 10.6.Test Result

Test Lab: Shielding room

Test Engineer: Ben

### GFSK Mode

| Channel | Frequency (MHz) | Peak Output Power (dBm/W) | Limits dBm / W |
|---------|-----------------|---------------------------|----------------|
| Low     | 2402            | 1.13/0.0013               | 21 / 0.125     |
| Middle  | 2441            | 1.94/0.0016               | 21 / 0.125     |
| High    | 2480            | 1.84/0.0015               | 21 / 0.125     |

### II/4-DQPSK Mode

| Channel | Frequency (MHz) | Peak Output Power (dBm/W) | Limits dBm / W |
|---------|-----------------|---------------------------|----------------|
| Low     | 2402            | 1.40/0.0014               | 21 / 0.125     |
| Middle  | 2441            | 2.20/0.0017               | 21 / 0.125     |
| High    | 2480            | 2.05/0.0016               | 21 / 0.125     |

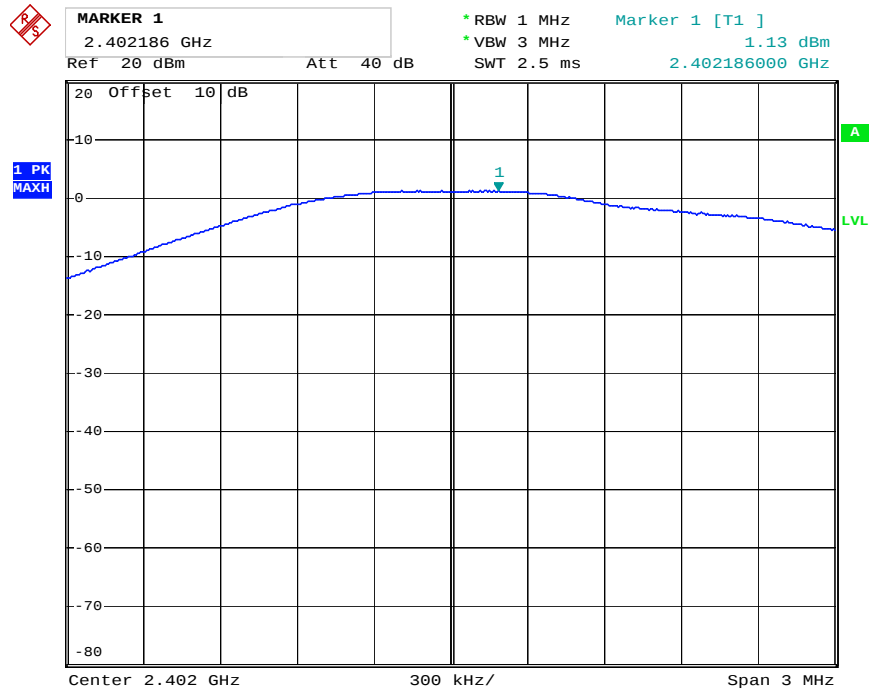
### 8DPSK Mode

| Channel | Frequency (MHz) | Peak Output Power (dBm/W) | Limits dBm / W |
|---------|-----------------|---------------------------|----------------|
| Low     | 2402            | 1.31/0.0014               | 21 / 0.125     |
| Middle  | 2441            | 2.11/0.0016               | 21 / 0.125     |
| High    | 2480            | 2.32/0.0017               | 21 / 0.125     |

The spectrum analyzer plots are attached as below.

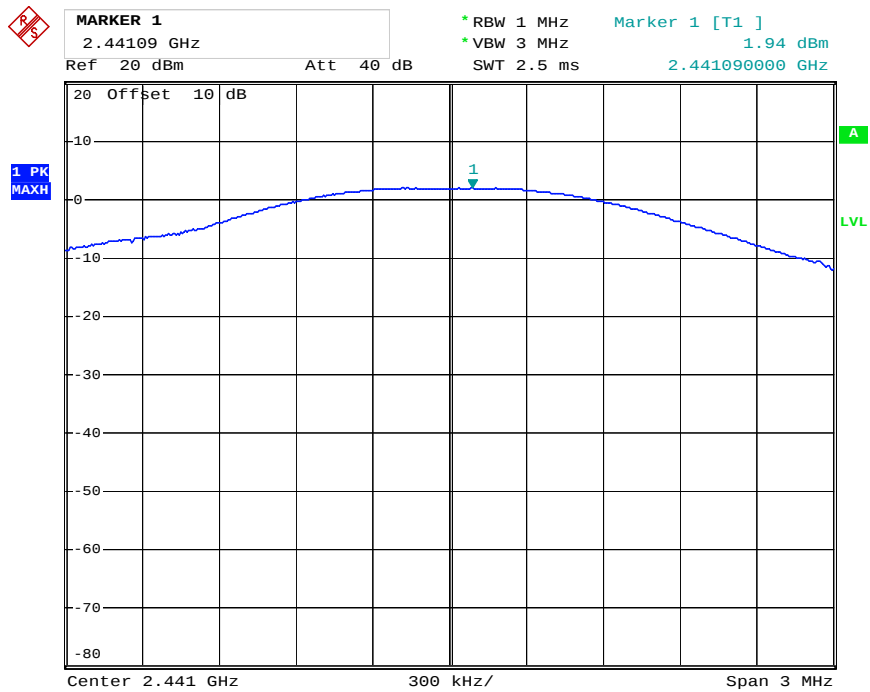
## GFSK Mode

### Low channel



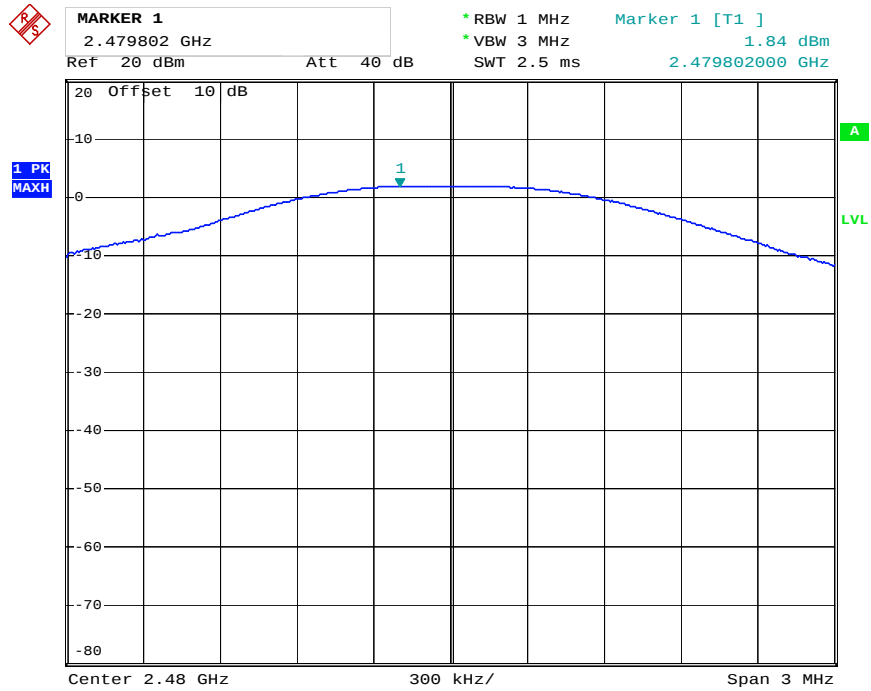
Date: 20.SEP.2019 15:20:55

### Middle channel



Date: 20.SEP.2019 15:21:51

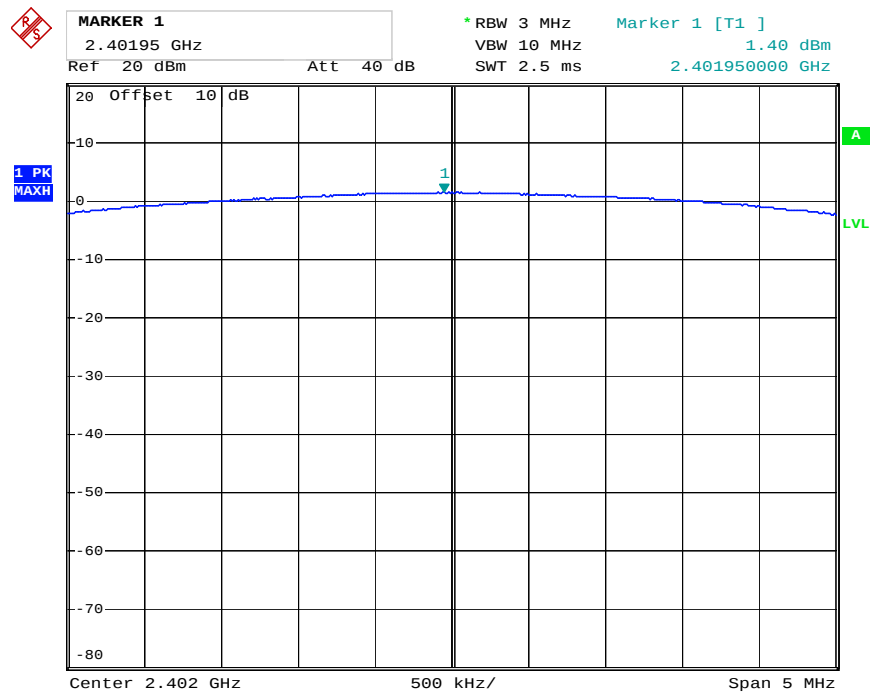
## High channel



Date: 20.SEP.2019 15:22:58

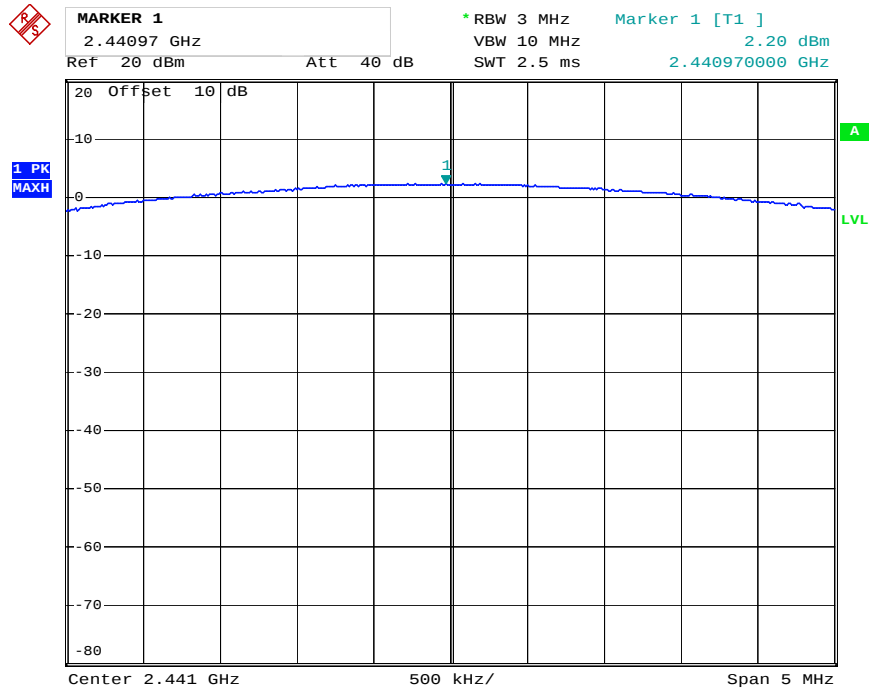
## Π/4-DQPSK Mode

## Low channel



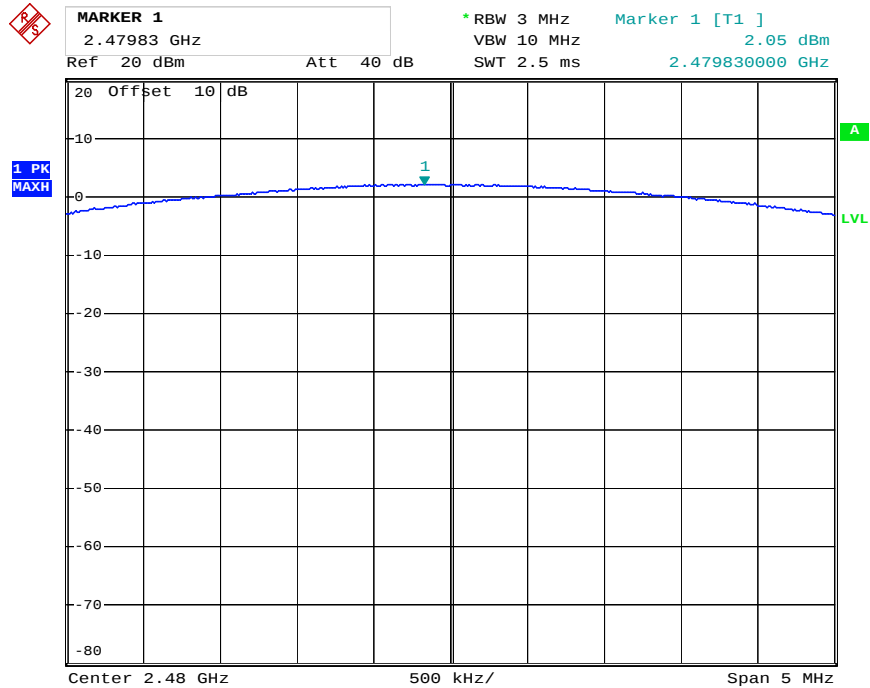
Date: 20.SEP.2019 15:24:09

## Middle channel



Date: 20.SEP.2019 15:25:00

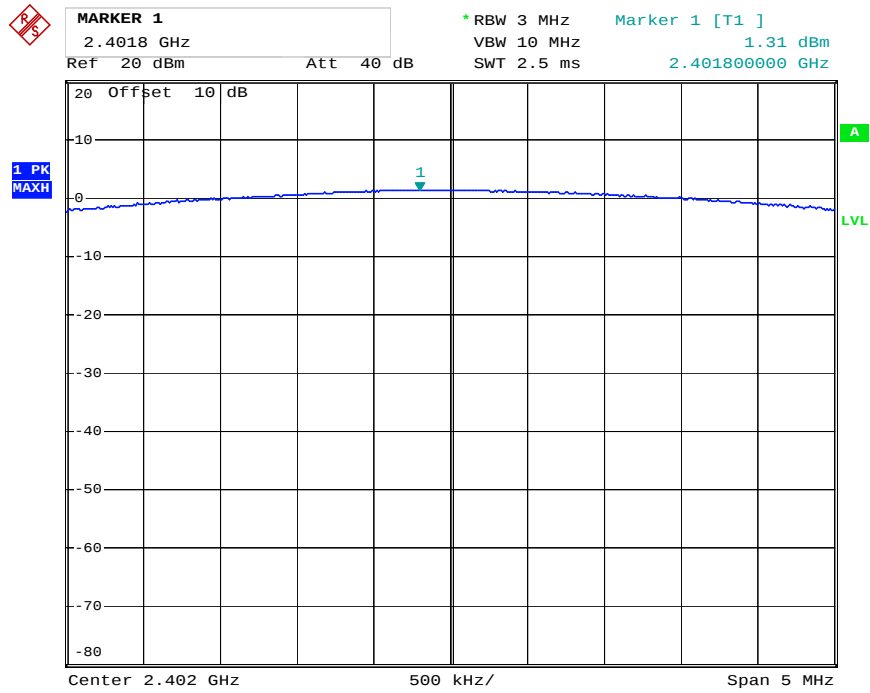
## High channel



Date: 20.SEP.2019 15:25:39

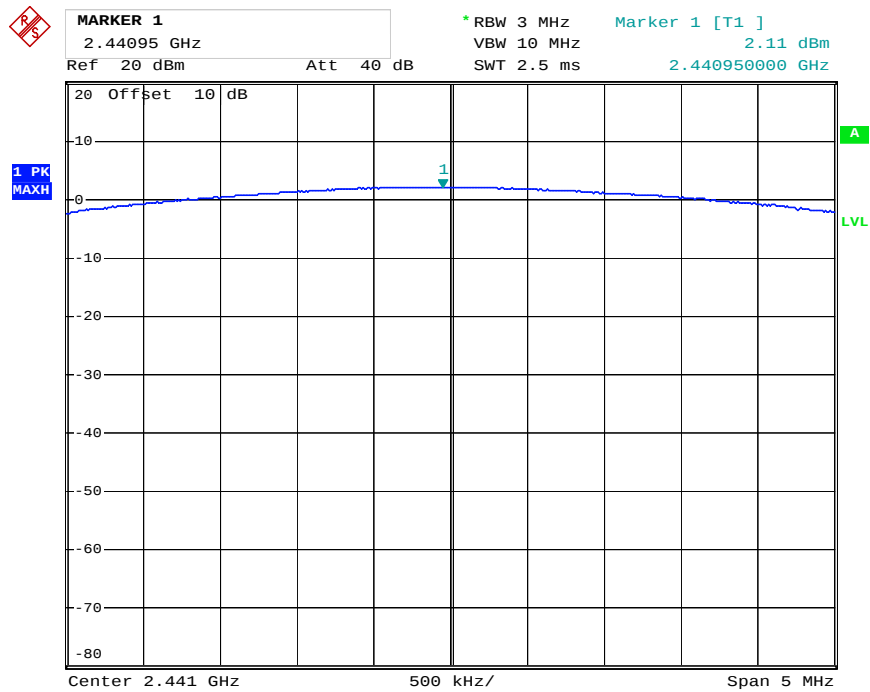
## 8DPSK Mode

### Low channel



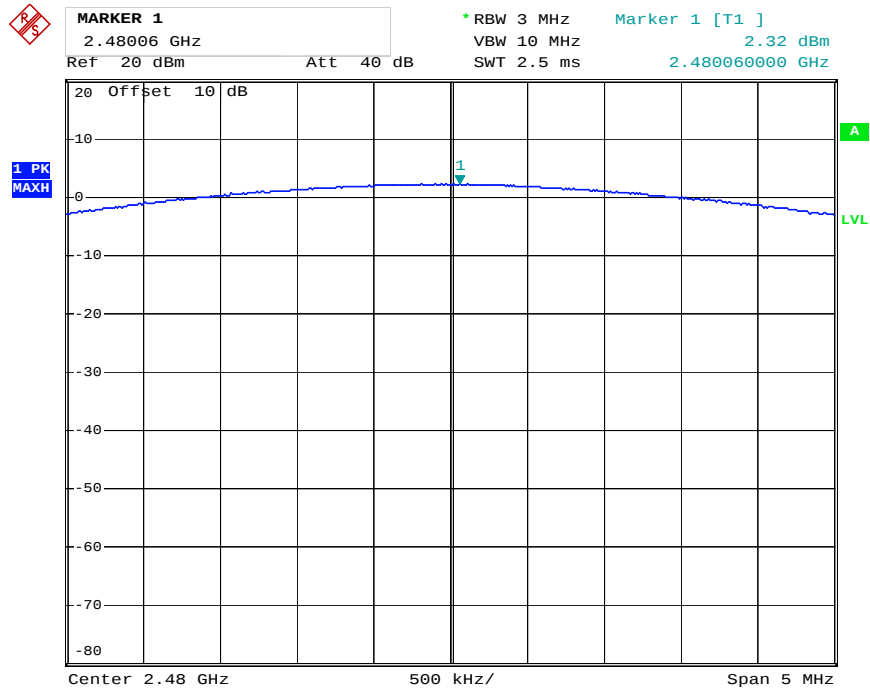
Date: 20.SEP.2019 15:26:34

### Middle channel



Date: 20.SEP.2019 15:27:15

### High channel

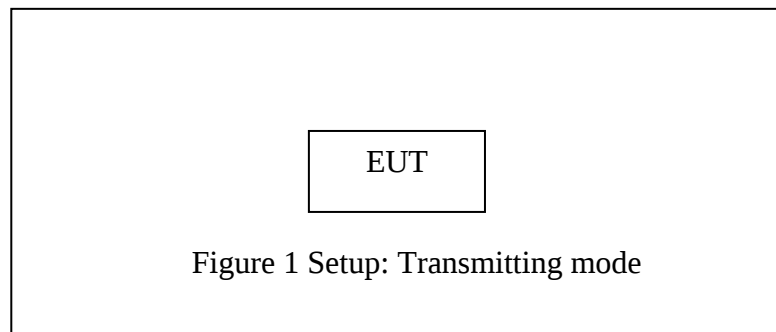


Date: 20.SEP.2019 15:27:42

## 11.RADIATED EMISSION TEST

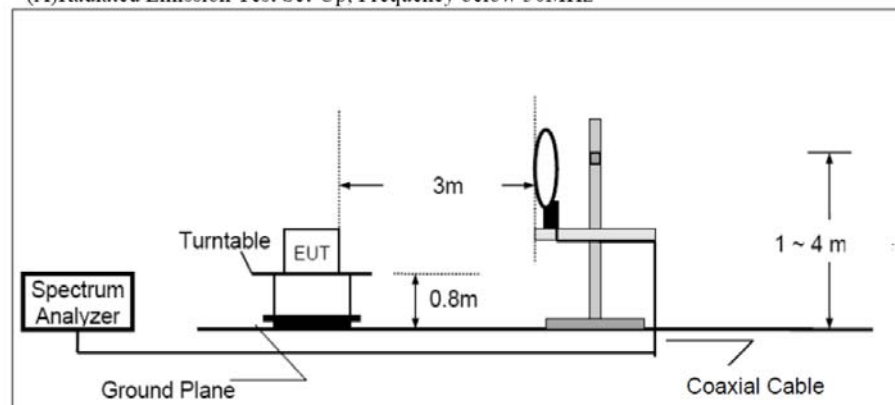
### 11.1.Block Diagram of Test Setup

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

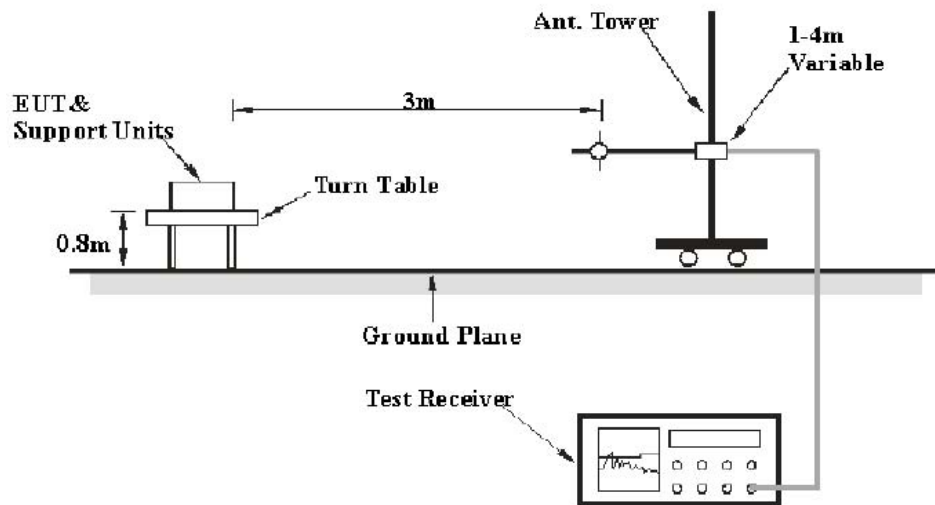


#### 11.1.2.Semi-Anechoic Chamber Test Setup Diagram

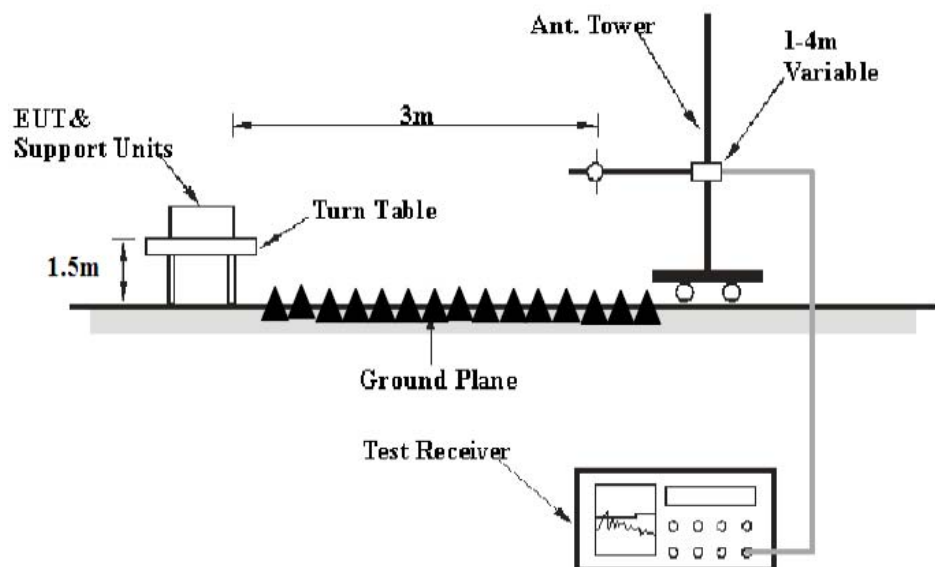
(A)Radiated Emission Test Set-Up, Frequency below 30MHz



(B) Radiated Emission Test Set-Up, Frequency 30MHz-1GHz



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



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

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the

general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

### 11.3.Restricted bands of operation

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

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

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

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

<sup>2</sup>Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emission appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, Compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

### 11.4.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.

## 11.5. Operating Condition of EUT

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

11.5.2. Turn on the power of all equipment.

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

## 11.6. 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.

### 11.7.Data Sample

| Frequency<br>(MHz) | Reading<br>(dB $\mu$ v) | Factor<br>(dB/m) | Result<br>(dB $\mu$ v/m) | Limit<br>(dB $\mu$ v/m) | Margin<br>(dB) | Remark |
|--------------------|-------------------------|------------------|--------------------------|-------------------------|----------------|--------|
| X.XX               | 28.66                   | -15.19           | 13.47                    | 40.0                    | -26.53         | 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.

### 11.8.Tetst Results

**Pass.**

Test Lab: 3m Anechoic chamber

Test Engineer: Ben

Note: 1.We tested GFSK mode,  $\Pi/4$ -DQPSK Mode & 8DPSK mode and recorded the Worse case data (GFSK mode) for all test mode.

2. Testing is carried out with frequency rang 9kHz to the tenth harmonics, which above 3th Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

The measurements greater than 20dB below the limit from 9kHz to 30MHz and 18 to 26.5GHz.

The spectrum analyzer plots are attached as below.

## Below 1GHz



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Site: 1# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: JPZRLK #36

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: True Wireless Earbuds

Mode: TX 2402MHz

Model: BE1028

Manufacturer: Kinlan

Polarization: Vertical

Power Source: DC 3.7V

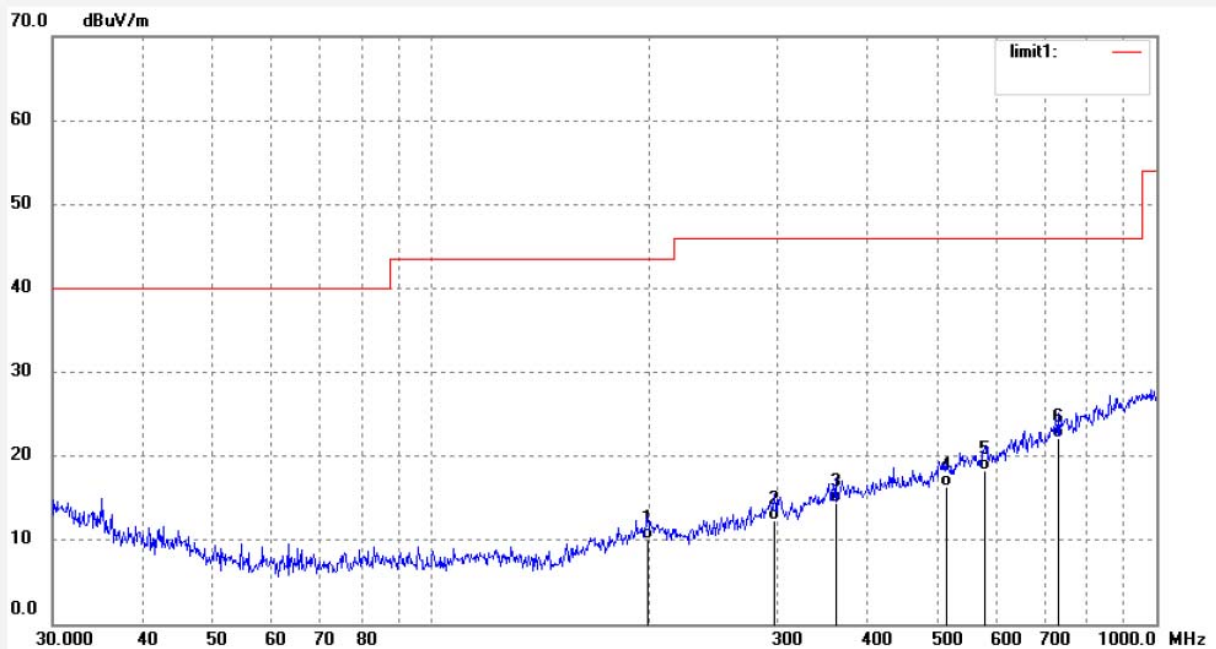
Date: 2019/09/17

Time: 17:28:09

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20191376



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 198.6424    | 34.54            | -24.44      | 10.10           | 43.50          | -33.40      | QP       | 100         | 93            |        |
| 2   | 297.5459    | 33.72            | -21.32      | 12.40           | 46.00          | -33.60      | QP       | 100         | 126           |        |
| 3   | 360.9775    | 33.40            | -18.90      | 14.50           | 46.00          | -31.50      | QP       | 100         | 175           |        |
| 4   | 512.9477    | 32.31            | -15.91      | 16.40           | 46.00          | -29.60      | QP       | 100         | 215           |        |
| 5   | 580.0705    | 32.41            | -14.11      | 18.30           | 46.00          | -27.70      | QP       | 100         | 286           |        |
| 6   | 734.0373    | 32.89            | -10.69      | 22.20           | 46.00          | -23.80      | QP       | 100         | 316           |        |



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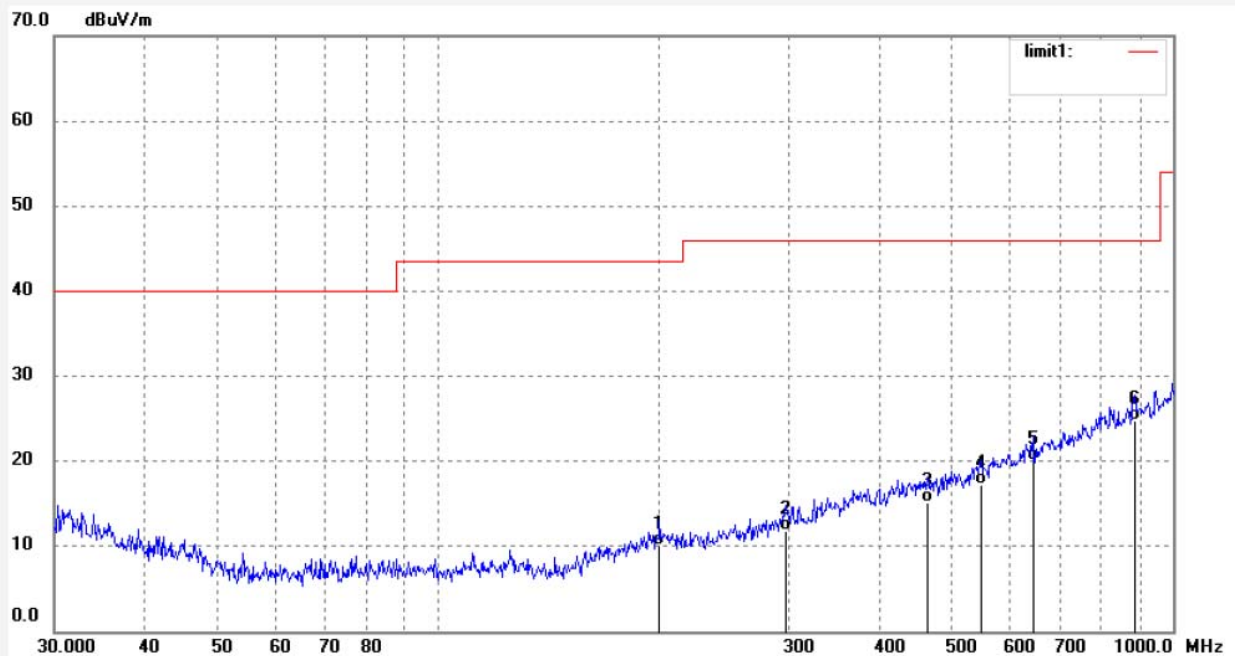
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,  
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber  
Tel:+86-0755-26503290  
Fax:+86-0755-26503396

Job No.: JPZRLK #37  
Standard: FCC Class B 3M Radiated  
Test item: Radiation Test  
Temp.( C)/Hum.(%) 25 C / 55 %  
EUT: True Wireless Earbuds  
Mode: TX 2402MHz  
Model: BE1028  
Manufacturer: Kinlan

Polarization: Horizontal  
Power Source: DC 3.7V  
Date: 2019/09/17  
Time: 17:29:57  
Engineer Signature: Ben  
Distance: 3m

Note: Report NO.:ATE20191376



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 200.0432    | 34.46            | -24.36      | 10.10           | 43.50          | -33.40      | QP       | 200         | 106           |        |
| 2   | 297.5459    | 33.12            | -21.32      | 11.80           | 46.00          | -34.20      | QP       | 200         | 138           |        |
| 3   | 463.2562    | 32.09            | -16.89      | 15.20           | 46.00          | -30.80      | QP       | 200         | 186           |        |
| 4   | 548.3600    | 32.16            | -14.85      | 17.31           | 46.00          | -28.69      | QP       | 200         | 206           |        |
| 5   | 644.5531    | 32.76            | -12.76      | 20.00           | 46.00          | -26.00      | QP       | 200         | 256           |        |
| 6   | 887.3978    | 32.11            | -7.41       | 24.70           | 46.00          | -21.30      | QP       | 200         | 309           |        |



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Site: 1# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: JPZRLK #38

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: True Wireless Earbuds

Mode: TX 2441MHz

Model: BE1028

Manufacturer: Kinlan

Polarization: Horizontal

Power Source: DC 3.7V

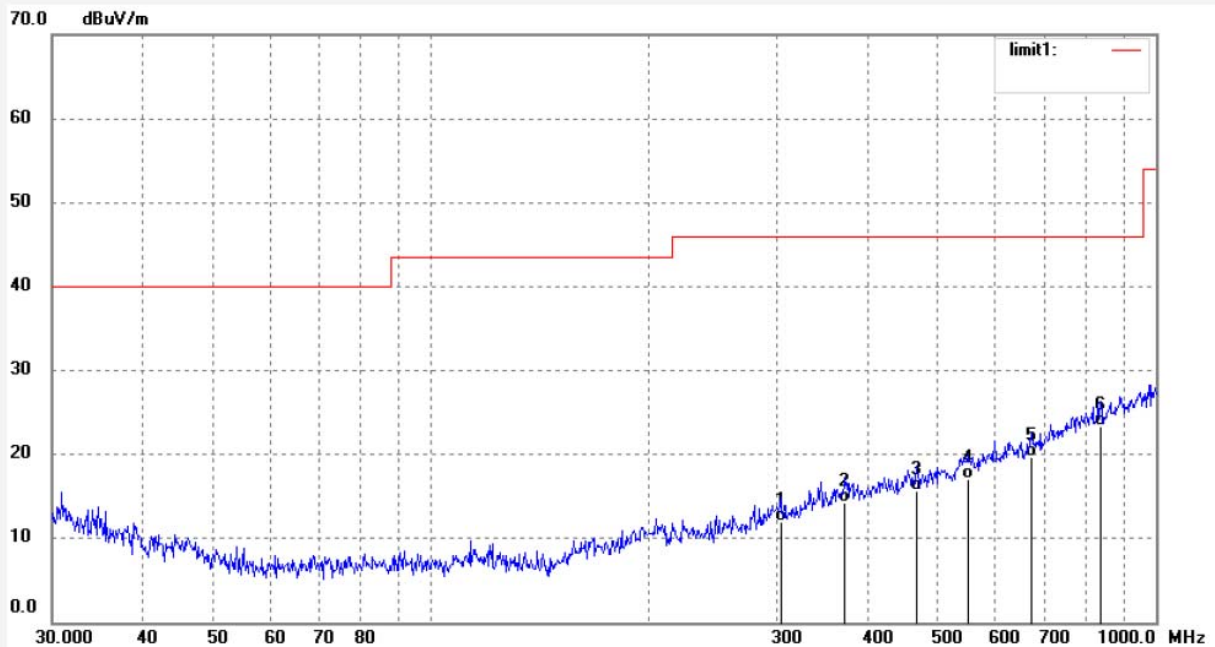
Date: 2019/09/17

Time: 17:31:08

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20191376



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 303.8851    | 33.11            | -21.11      | 12.00           | 46.00          | -34.00      | QP       | 200         | 106           |        |
| 2   | 372.5748    | 33.04            | -18.74      | 14.30           | 46.00          | -31.70      | QP       | 200         | 139           |        |
| 3   | 468.1650    | 32.41            | -16.80      | 15.61           | 46.00          | -30.39      | QP       | 200         | 186           |        |
| 4   | 550.2902    | 31.79            | -14.79      | 17.00           | 46.00          | -29.00      | QP       | 200         | 216           |        |
| 5   | 672.3104    | 31.81            | -12.11      | 19.70           | 46.00          | -26.30      | QP       | 200         | 296           |        |
| 6   | 838.8870    | 31.54            | -8.24       | 23.30           | 46.00          | -22.70      | QP       | 200         | 319           |        |



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Site: 1# Chamber

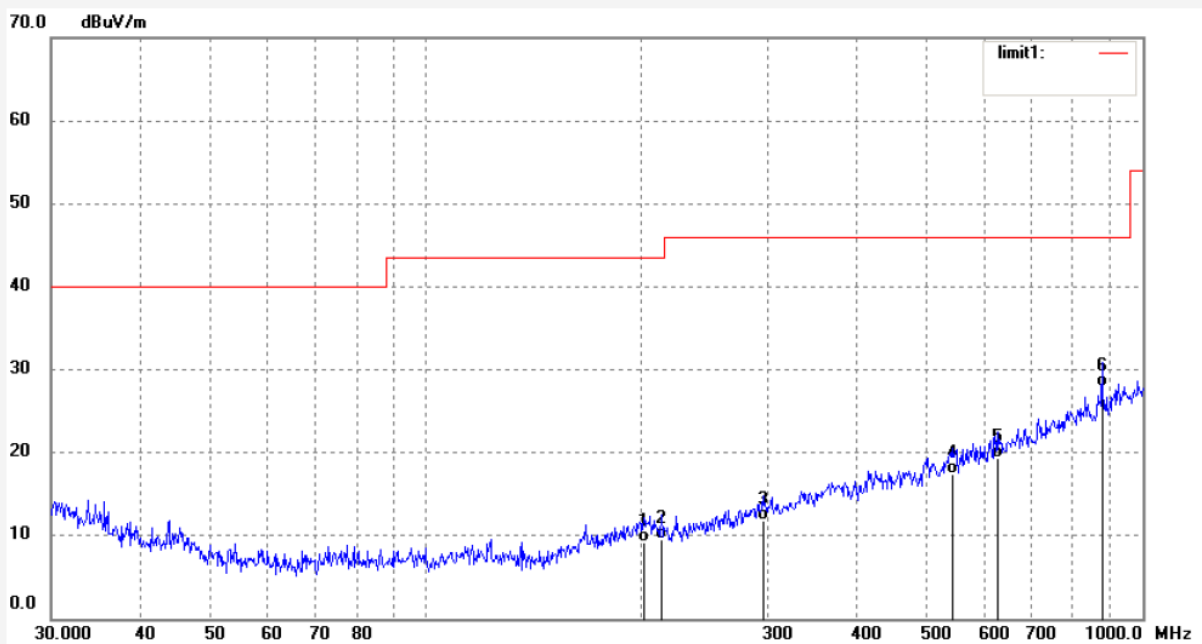
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: JPZRLK #39  
Standard: FCC Class B 3M Radiated  
Test item: Radiation Test  
Temp.( C)/Hum.(%) 25 C / 55 %  
EUT: True Wireless Earbuds  
Mode: TX 2441MHz  
Model: BE1028  
Manufacturer: Kinlan

Polarization: Vertical  
Power Source: DC 3.7V  
Date: 2019/09/17  
Time: 17:32:32  
Engineer Signature: Ben  
Distance: 3m

Note: Report NO.:ATE20191376



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 201.4539    | 33.50            | -24.30      | 9.20            | 43.50          | -34.30      | QP       | 100         | 126           |        |
| 2   | 213.1035    | 33.58            | -24.08      | 9.50            | 43.50          | -34.00      | QP       | 100         | 156           |        |
| 3   | 295.4623    | 33.19            | -21.39      | 11.80           | 46.00          | -34.20      | QP       | 100         | 196           |        |
| 4   | 542.6104    | 32.53            | -15.03      | 17.50           | 46.00          | -28.50      | QP       | 100         | 206           |        |
| 5   | 626.6878    | 32.52            | -13.12      | 19.40           | 46.00          | -26.60      | QP       | 100         | 245           |        |
| 6   | 878.0931    | 35.46            | -7.56       | 27.90           | 46.00          | -18.10      | QP       | 100         | 319           |        |



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Site: 1# Chamber

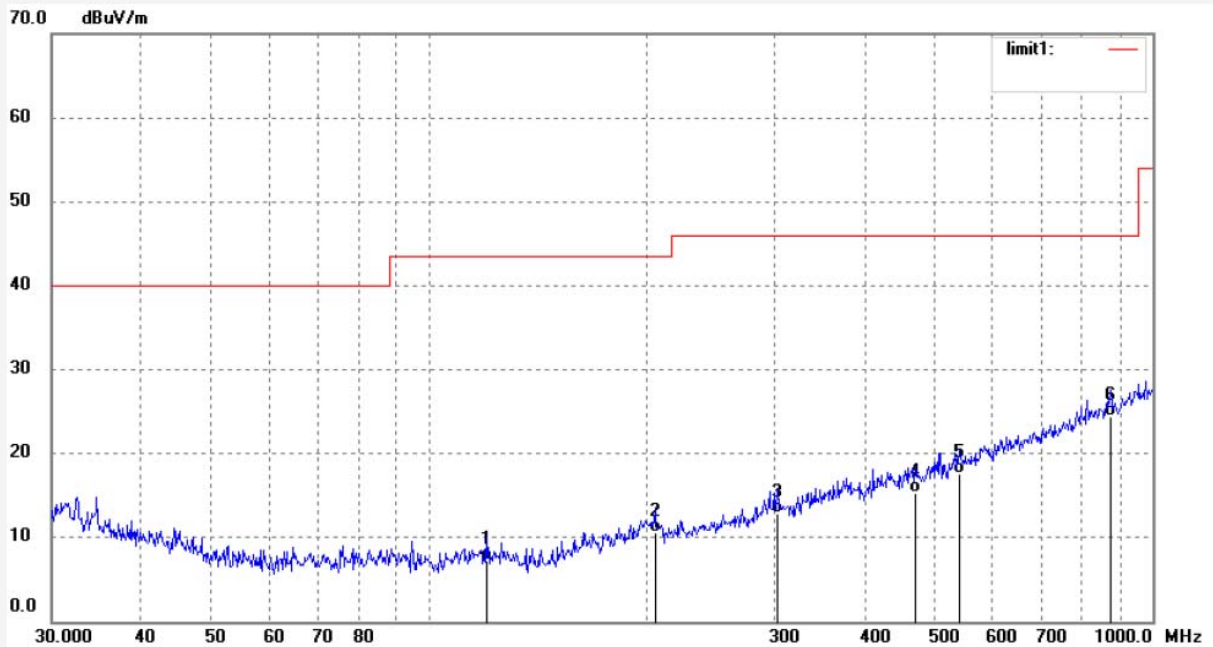
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: JPZRLK #40  
Standard: FCC Class B 3M Radiated  
Test item: Radiation Test  
Temp.( C)/Hum.(%) 25 C / 55 %  
EUT: True Wireless Earbuds  
Mode: TX 2480MHz  
Model: BE1028  
Manufacturer: Kinlan

Polarization: Vertical  
Power Source: DC 3.7V  
Date: 2019/09/17  
Time: 17:33:41  
Engineer Signature: Ben  
Distance: 3m

Note: Report NO.:ATE20191376



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 119.7672    | 34.63            | -27.43      | 7.20            | 43.50          | -36.30      | QP       | 100         | 108           |        |
| 2   | 205.0243    | 34.76            | -24.16      | 10.60           | 43.50          | -32.90      | QP       | 100         | 139           |        |
| 3   | 302.8193    | 34.03            | -21.13      | 12.90           | 46.00          | -33.10      | QP       | 100         | 186           |        |
| 4   | 469.8129    | 32.17            | -16.77      | 15.40           | 46.00          | -30.60      | QP       | 100         | 206           |        |
| 5   | 540.7072    | 32.69            | -15.09      | 17.60           | 46.00          | -28.40      | QP       | 100         | 275           |        |
| 6   | 875.0133    | 32.11            | -7.61       | 24.50           | 46.00          | -21.50      | QP       | 100         | 308           |        |



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Site: 1# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: JPZRLK #41

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: True Wireless Earbuds

Mode: TX 2480MHz

Model: BE1028

Manufacturer: Kinlan

Polarization: Horizontal

Power Source: DC 3.7V

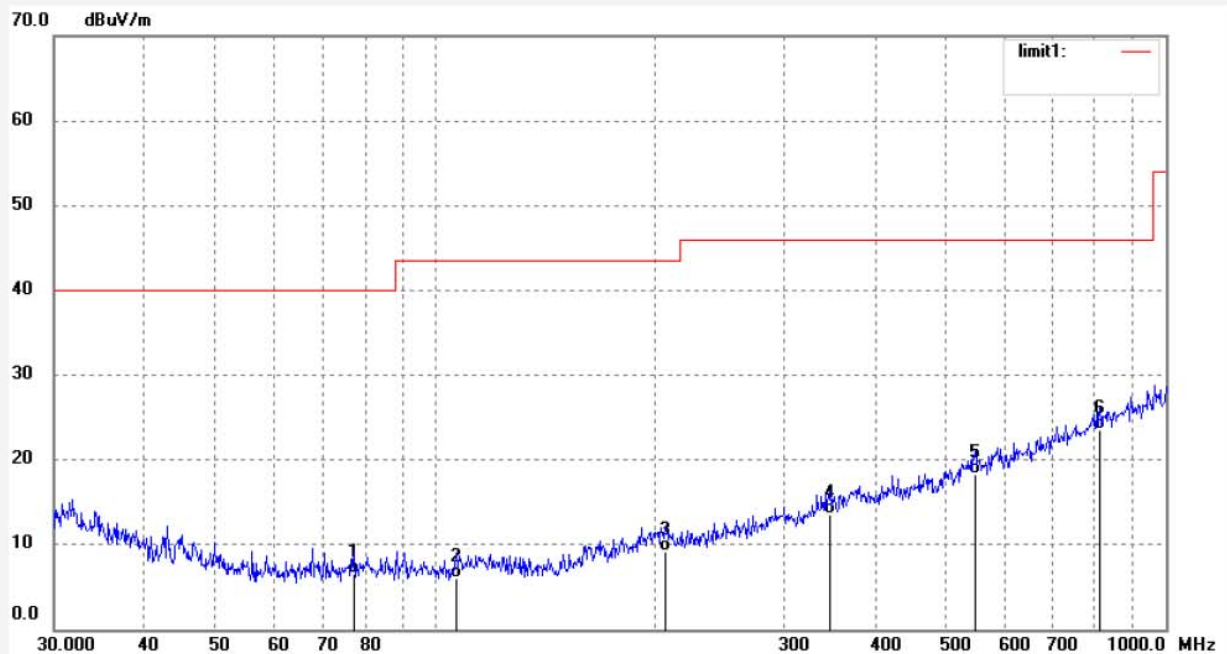
Date: 2019/09/17

Time: 17:34:52

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20191376



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 77.1963     | 34.07            | -27.57      | 6.50            | 40.00          | -33.50      | QP       | 200         | 106           |        |
| 2   | 106.6552    | 33.86            | -27.86      | 6.00            | 43.50          | -37.50      | QP       | 200         | 162           |        |
| 3   | 206.4701    | 33.34            | -24.14      | 9.20            | 43.50          | -34.30      | QP       | 200         | 193           |        |
| 4   | 347.2921    | 32.92            | -19.42      | 13.50           | 46.00          | -32.50      | QP       | 200         | 205           |        |
| 5   | 548.3600    | 33.15            | -14.85      | 18.30           | 46.00          | -27.70      | QP       | 200         | 249           |        |
| 6   | 812.7745    | 32.21            | -8.71       | 23.50           | 46.00          | -22.50      | QP       | 200         | 325           |        |

## Above 1GHz



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Site: 1# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: JPZRLK #42

Standard: FCC PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: True Wireless Earbuds

Mode: TX 2402MHz

Model: BE1028

Manufacturer: Kinlan

Polarization: Horizontal

Power Source: DC 3.7V

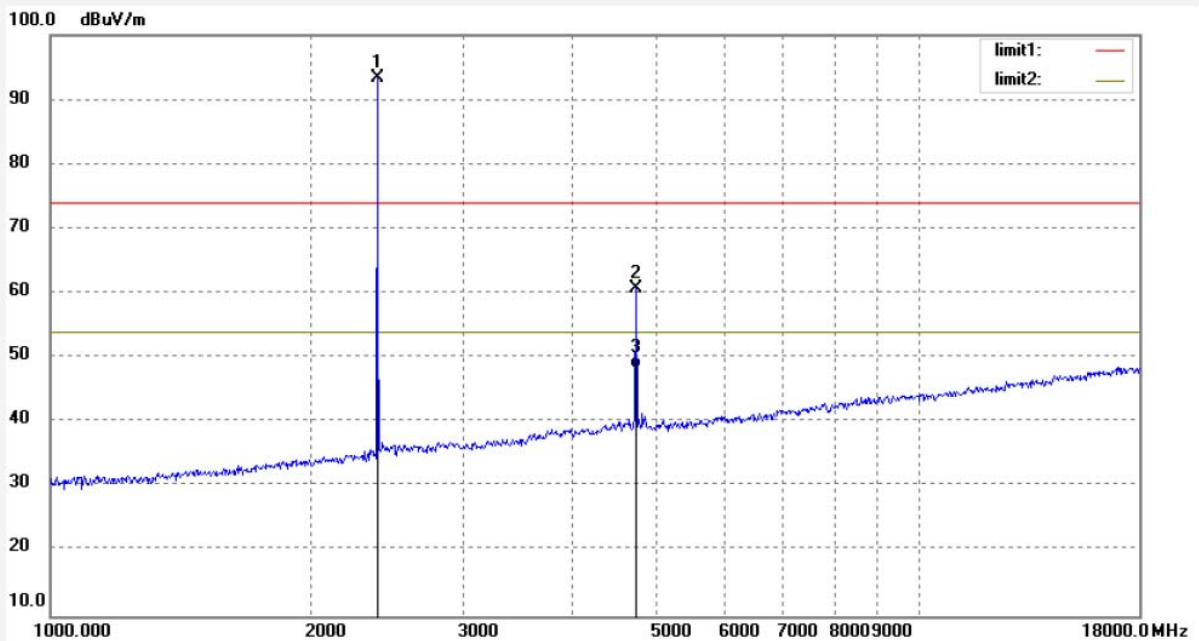
Date: 19/09/19/

Time: 9/22/18

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20191376



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2402.019    | 99.74            | -6.37       | 93.37           | 74.00          |             |          | 200         | 186           |        |
| 2   | 4804.057    | 60.11            | 0.70        | 60.81           | 74.00          | -13.19      | peak     | 200         | 196           |        |
| 3   | 4804.057    | 47.60            | 0.70        | 48.30           | 54.00          | -5.70       | AVG      | 200         | 123           |        |



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Site: 1# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: JPZRLK #43

Standard: FCC PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: True Wireless Earbuds

Mode: TX 2402MHz

Model: BE1028

Manufacturer: Kinlan

Polarization: Vertical

Power Source: DC 3.7V

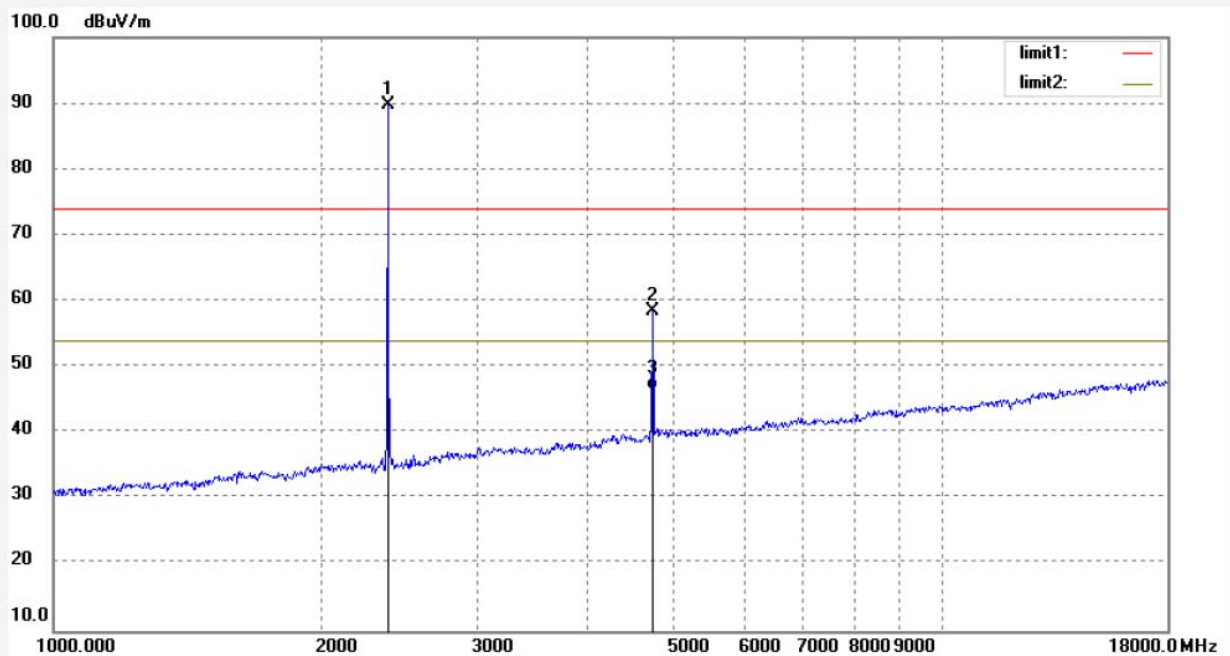
Date: 19/09/19/

Time: 9/23/34

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20191376



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Height<br>(cm) | Degree<br>(deg.) | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|----------------|------------------|--------|
| 1   | 2402.019       | 96.07               | -6.37          | 89.70              |                   |                | peak     | 150            | 186              |        |
| 2   | 4804.057       | 57.81               | 0.70           | 58.51              | 74.00             | -15.49         | peak     | 150            | 210              |        |
| 3   | 4804.057       | 45.80               | 0.70           | 46.50              | 54.00             | -7.50          | AVG      | 150            | 163              |        |



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Site: 1# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: JPZRLK #44

Standard: FCC PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: True Wireless Earbuds

Mode: TX 2441MHz

Model: BE1028

Manufacturer: Kinlan

Polarization: Horizontal

Power Source: DC 3.7V

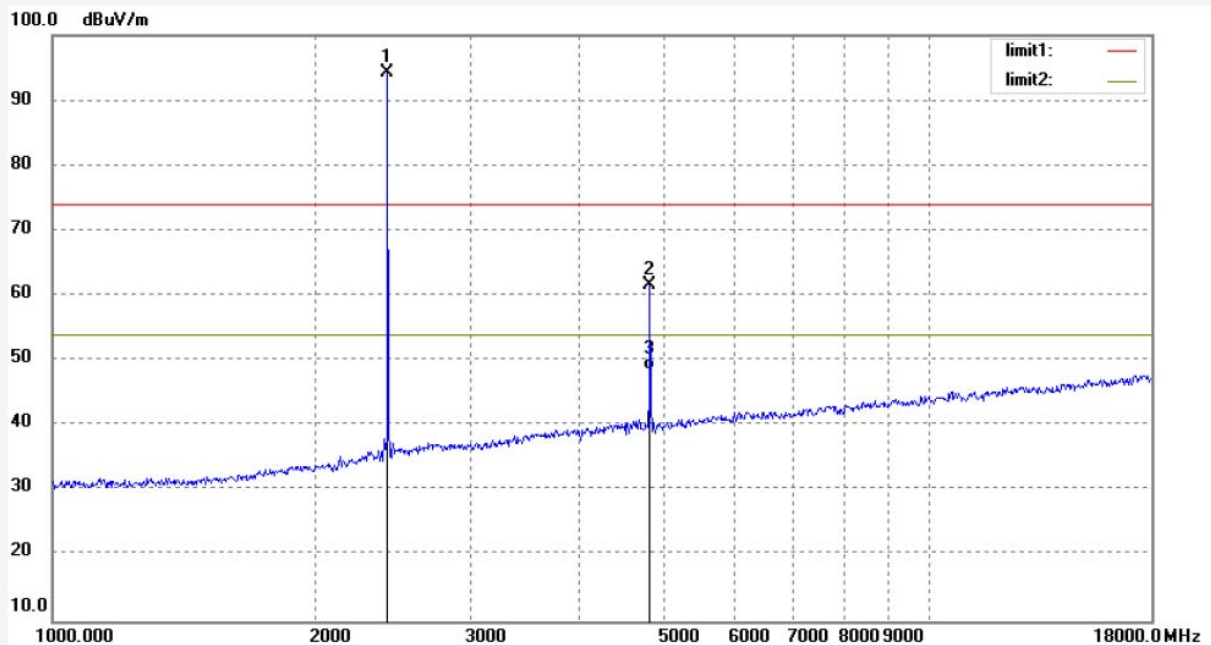
Date: 19/09/19/

Time: 9/25/33

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20191376



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2441.021    | 100.55           | -6.20       | 94.35           |                |             | peak     | 200         | 115           |        |
| 2   | 4882.024    | 60.59            | 1.07        | 61.66           | 74.00          | -12.34      | peak     | 200         | 206           |        |
| 3   | 4882.024    | 47.53            | 1.07        | 48.60           | 54.00          | -5.40       | AVG      | 200         | 186           |        |



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Site: 1# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: JPZRLK #45

Standard: FCC PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: True Wireless Earbuds

Mode: TX 2441MHz

Model: BE1028

Manufacturer: Kinlan

Polarization: Vertical

Power Source: DC 3.7V

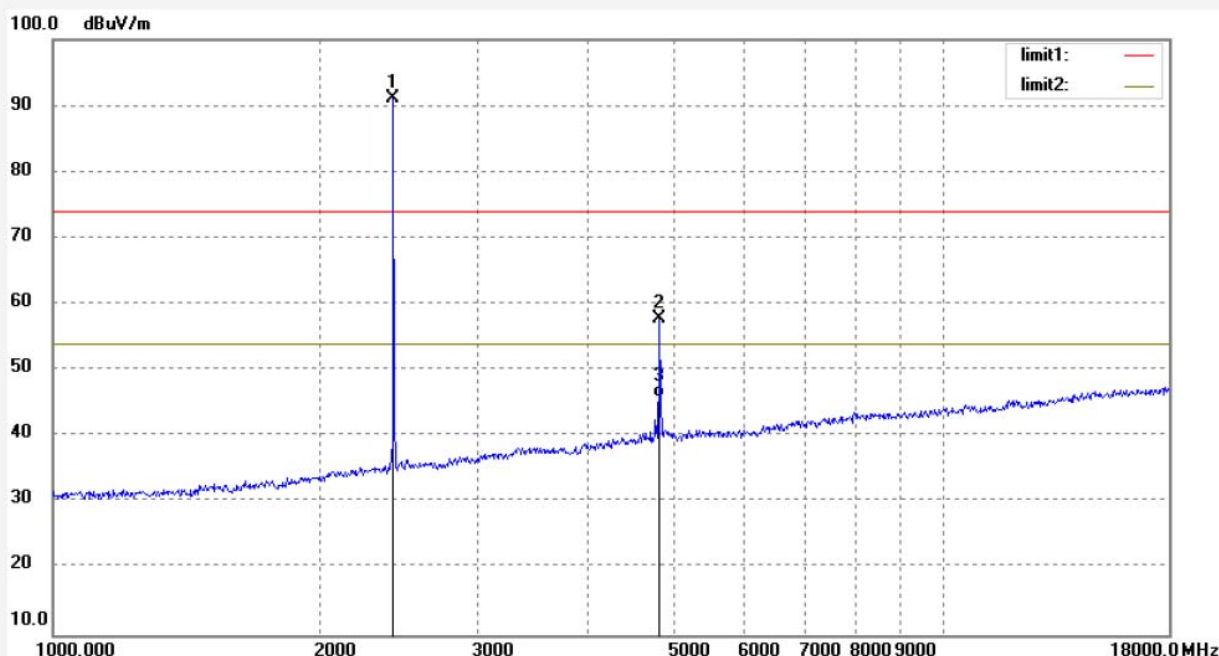
Date: 19/09/19/

Time: 9/32/38

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20191376



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2441.021    | 97.42            | -6.20       | 91.22           |                |             | peak     | 150         | 126           |        |
| 2   | 4882.024    | 56.78            | 1.07        | 57.85           | 74.00          | -16.15      | peak     | 150         | 215           |        |
| 3   | 4882.024    | 44.93            | 1.07        | 46.00           | 54.00          | -8.00       | AVG      | 150         | 186           |        |



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Site: 1# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: JPZRLK #46

Standard: FCC PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: True Wireless Earbuds

Mode: TX 2480MHz

Model: BE1028

Manufacturer: Kinlan

Polarization: Horizontal

Power Source: DC 3.7V

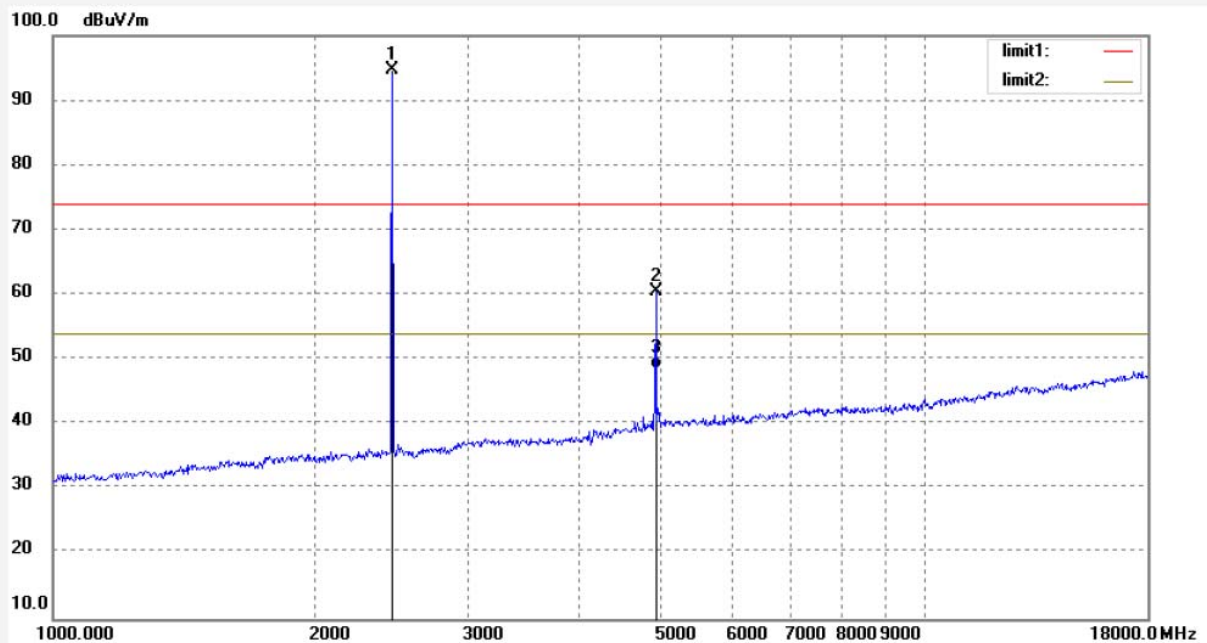
Date: 19/09/19/

Time: 9/34/07

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20191376



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2480.034    | 100.65           | -6.04       | 94.61           |                |             | peak     | 200         | 134           |        |
| 2   | 4960.044    | 59.03            | 1.50        | 60.53           | 74.00          | -13.47      | peak     | 200         | 185           |        |
| 3   | 4960.044    | 47.00            | 1.50        | 48.50           | 54.00          | -5.50       | AVG      | 200         | 236           |        |



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Site: 1# Chamber  
Tel:+86-0755-26503290  
Fax:+86-0755-26503396

Job No.: JPZRLK #47

Standard: FCC PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: True Wireless Earbuds

Mode: TX 2480MHz

Model: BE1028

Manufacturer: Kinlan

Polarization: Vertical

Power Source: DC 3.7V

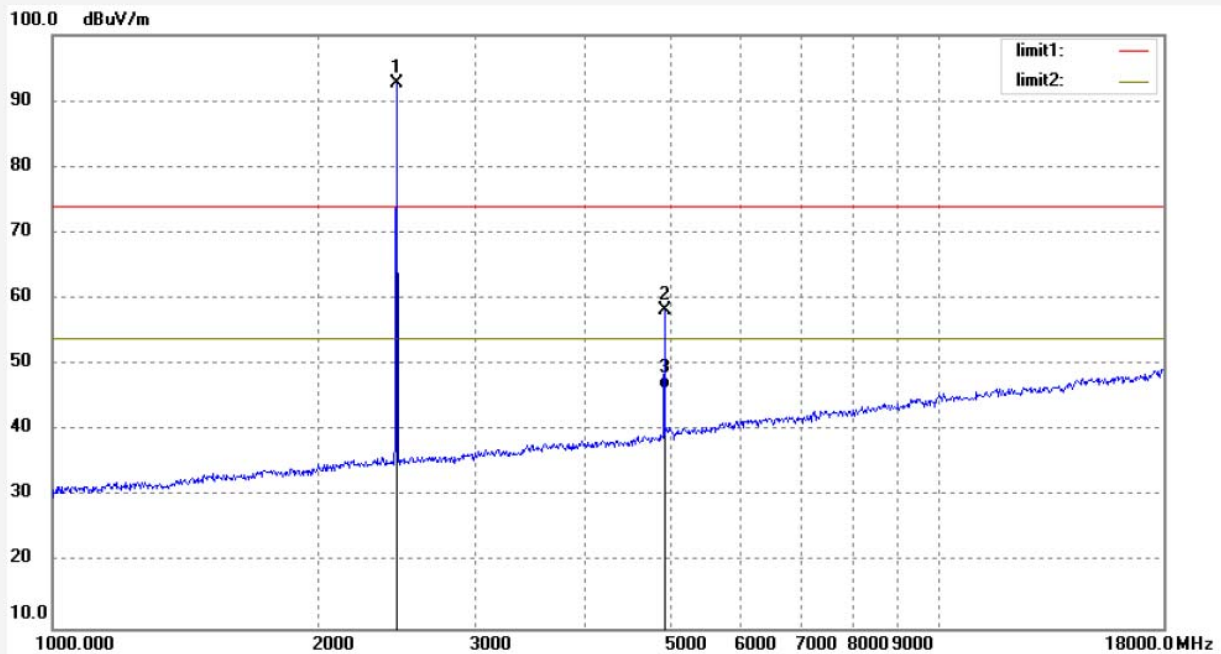
Date: 19/09/19/

Time: 9/38/28

Engineer Signature: Ben

Distance: 3m

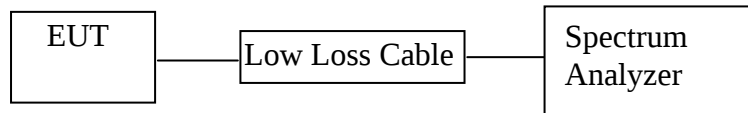
Note: Report NO.:ATE20191376



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2480.034    | 98.81            | -6.04       | 92.77           |                |             | peak     | 150         | 135           |        |
| 2   | 4960.044    | 56.84            | 1.50        | 58.34           | 74.00          | -15.66      | peak     | 150         | 203           |        |
| 3   | 4960.044    | 44.80            | 1.50        | 46.30           | 54.00          | -7.70       | AVG      | 150         | 286           |        |

## 12.BAND EDGE COMPLIANCE TEST

### 12.1.Block Diagram of Test Setup



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

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

### 12.3.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.

### 12.4.Operating Condition of EUT

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

12.4.2.Turn on the power of all equipment.

12.4.3.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.

## 12.5. Test Procedure

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

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

12.5.3. The band edges was measured and recorded.

## 12.6. Test Result

Test Lab: Shielding room

Test Engineer: Ben

Note: Both hopping-on mode and hopping-off mode had been pre-tested, and only the Worse case was recorded in the test report.

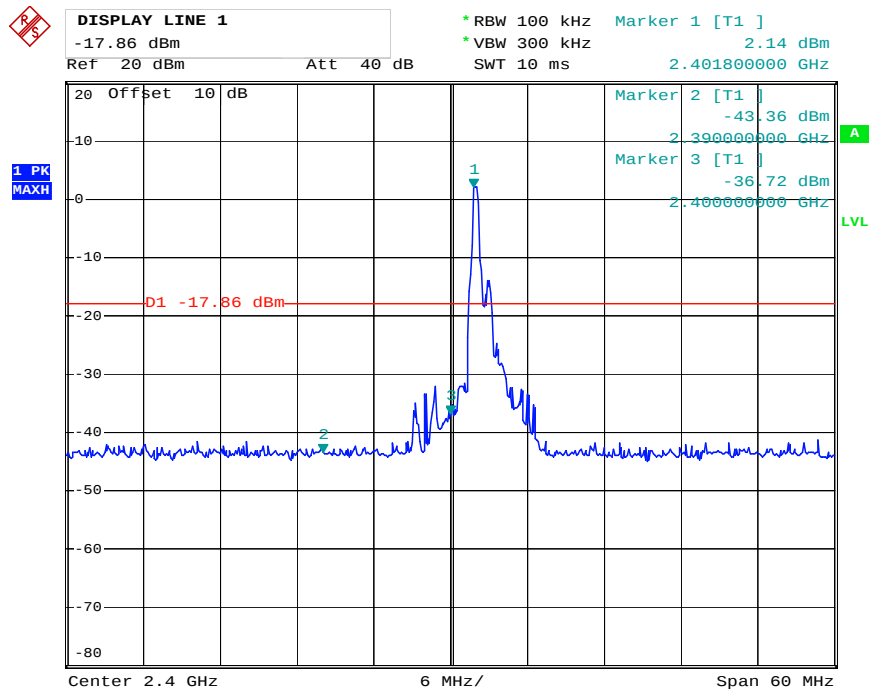
### Conducted Band Edge Result

#### Non-hopping mode

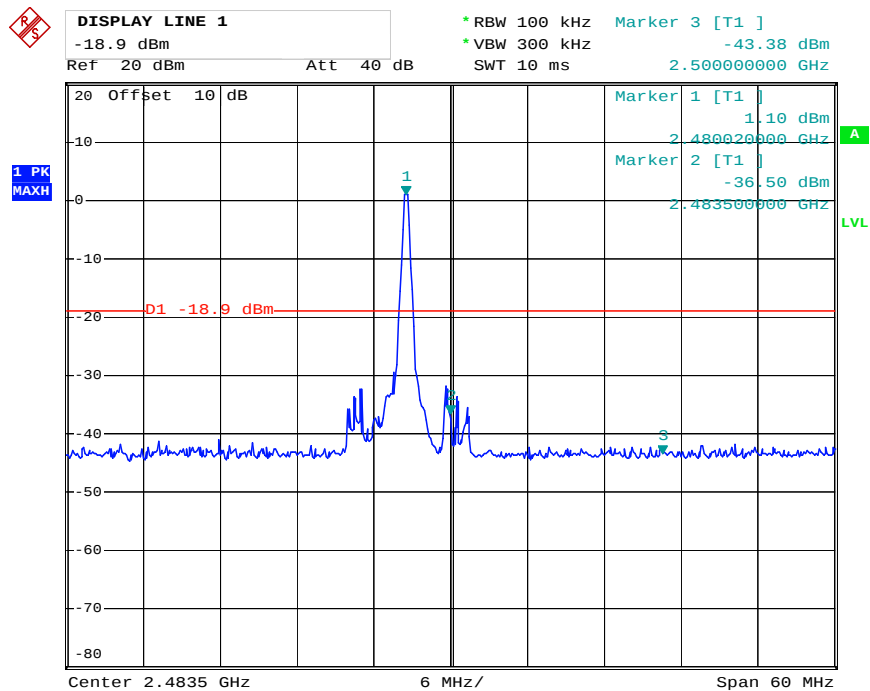
| Frequency (MHz)     | Result of Band Edge (dBc) | Limit of Band Edge (dBc) | Result |
|---------------------|---------------------------|--------------------------|--------|
| GFSK Mode           |                           |                          |        |
| 2400.00             | 34.58                     | > 20dBc                  | Pass   |
| 2483.50             | 35.40                     | > 20dBc                  | Pass   |
| $\Pi/4$ -DQPSK Mode |                           |                          |        |
| 2400.00             | 24.61                     | > 20dBc                  | Pass   |
| 2483.50             | 41.98                     | > 20dBc                  | Pass   |
| 8DPSK Mode          |                           |                          |        |
| 2400.00             | 24.56                     | > 20dBc                  | Pass   |
| 2483.50             | 42.93                     | > 20dBc                  | Pass   |

The spectrum analyzer plots are attached as below.

## GFSK Mode

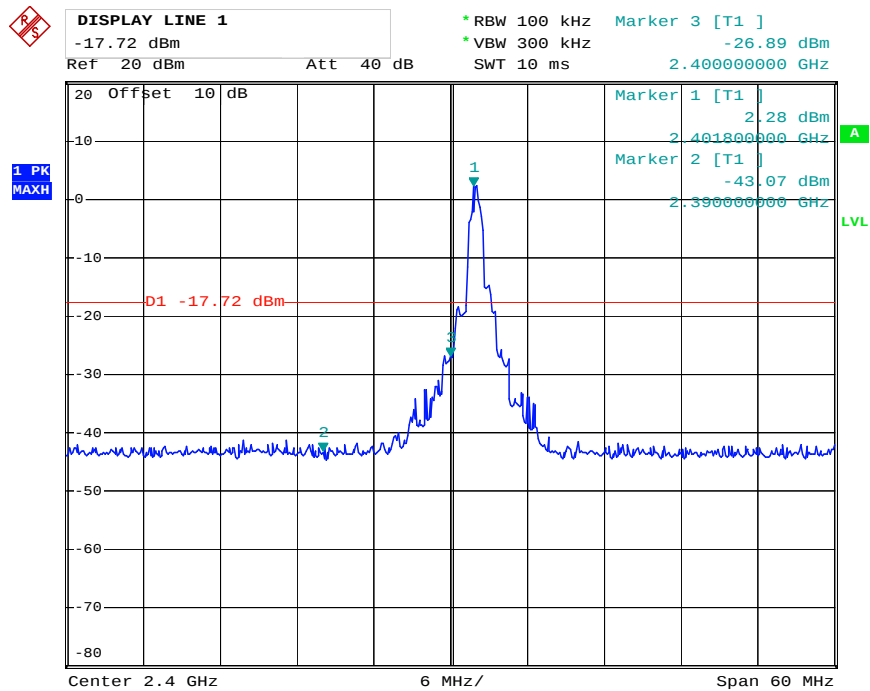


Date: 20.SEP.2019 14:10:26

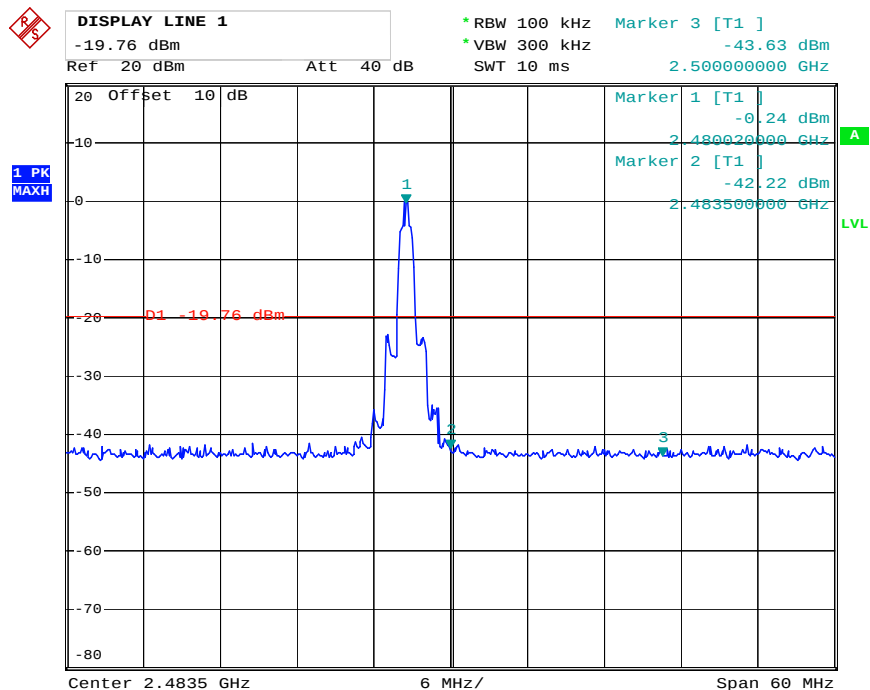


Date: 20.SEP.2019 14:15:14

## Π/4-DQPSK Mode

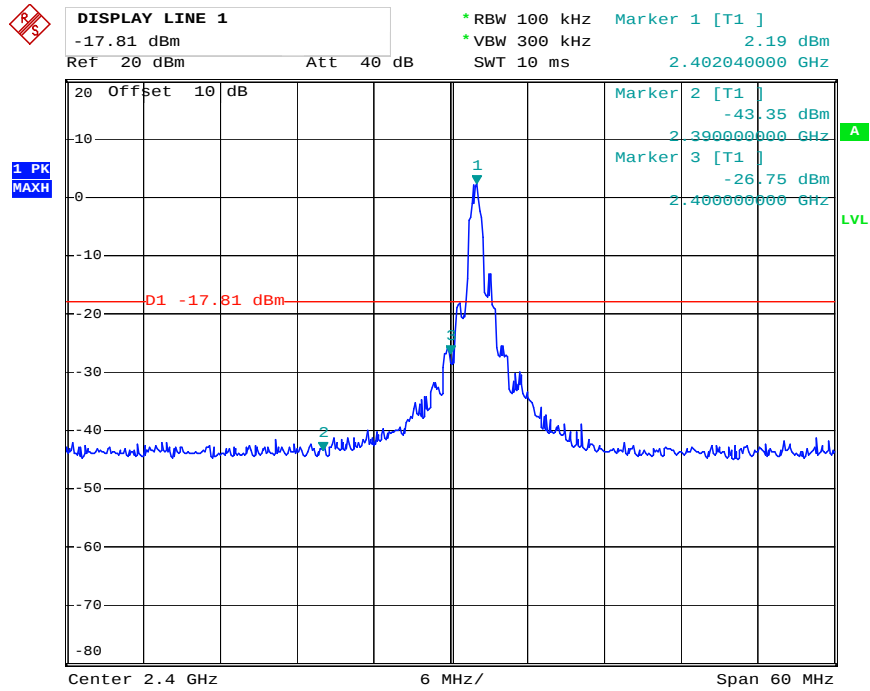


Date: 20.SEP.2019 14:18:03

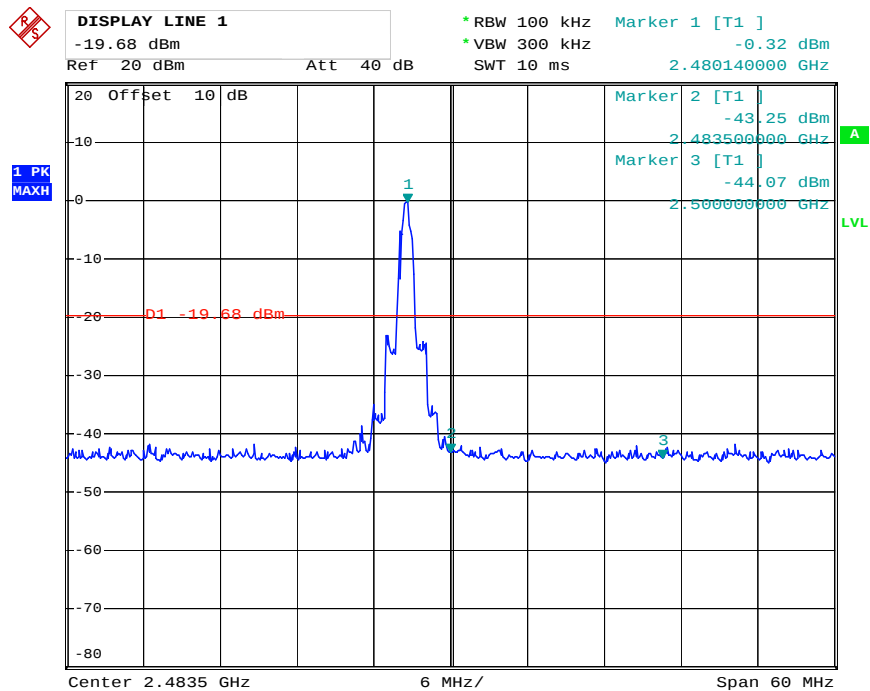


Date: 20.SEP.2019 14:20:00

## 8DPSK Mode



Date: 20.SEP.2019 14:22:17



Date: 20.SEP.2019 14:21:09

## Radiated Band Edge Result

Note:

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

Result = Reading + Corrected Factor

3. Display the measurement of peak values.

Test Procedure:

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

Let the EUT work in TX (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 (GFSK Mode) emissions are reported.

Test Lab: 3m Anechoic chamber

The spectrum analyzer plots are attached as below.

## Non-hopping mode



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Site: 1# Chamber

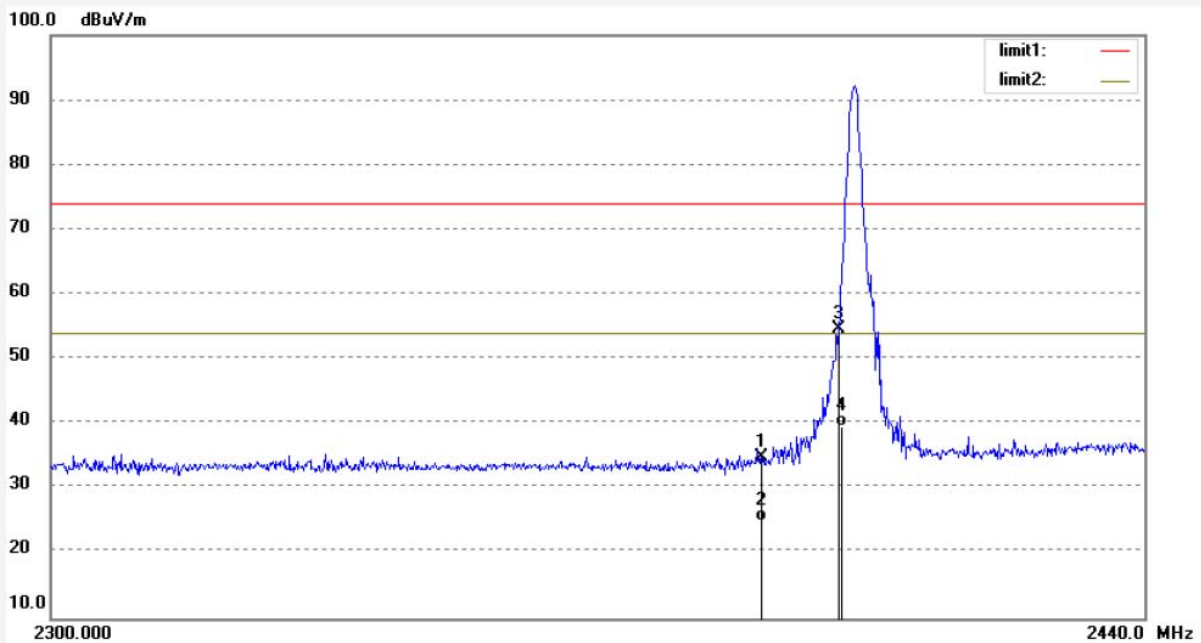
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: JPZRLK #51  
Standard: FCC PK  
Test item: Radiation Test  
Temp.( C)/Hum.(%) 25 C / 55 %  
EUT: True Wireless Earbuds  
Mode: TX 2402MHz  
Model: BE1028  
Manufacturer: Kinlan

Polarization: Horizontal  
Power Source: DC 3.7V  
Date: 19/09/19/  
Time: 9/48/46  
Engineer Signature: Ben  
Distance: 3m

Note: Report NO.:ATE20191376



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2390.000    | 41.24            | -6.32       | 34.92           | 74.00          | -39.08      | peak     | 200         | 156           |        |
| 2   | 2390.000    | 31.22            | -6.32       | 24.90           | 54.00          | -29.10      | AVG      | 200         | 196           |        |
| 3   | 2400.000    | 60.89            | -6.27       | 54.62           | 74.00          | -19.38      | peak     | 200         | 245           |        |
| 4   | 2400.000    | 45.87            | -6.27       | 39.60           | 54.00          | -14.40      | AVG      | 200         | 315           |        |

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



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Fax:+86-0755-26503396

Job No.: JPZRLK #50

Standard: FCC PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: True Wireless Earbuds

Mode: TX 2402MHz

Model: BE1028

Manufacturer: Kinlan

Polarization: Vertical

Power Source: DC 3.7V

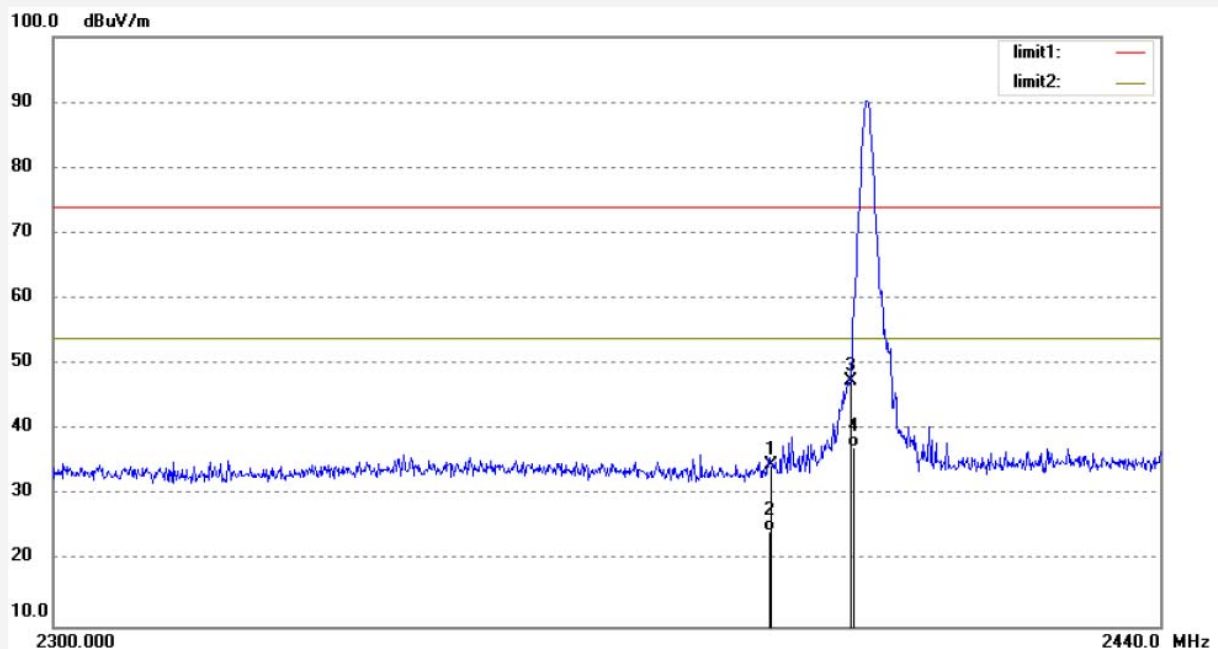
Date: 19/09/19/

Time: 9/47/25

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20191376



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2390.000    | 40.98            | -6.32       | 34.66           | 74.00          | -39.34      | peak     | 150         | 103           |        |
| 2   | 2390.000    | 30.92            | -6.32       | 24.60           | 54.00          | -29.40      | AVG      | 150         | 163           |        |
| 3   | 2400.000    | 53.69            | -6.27       | 47.42           | 74.00          | -26.58      | peak     | 150         | 236           |        |
| 4   | 2400.000    | 43.67            | -6.27       | 37.40           | 54.00          | -16.60      | AVG      | 150         | 296           |        |

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



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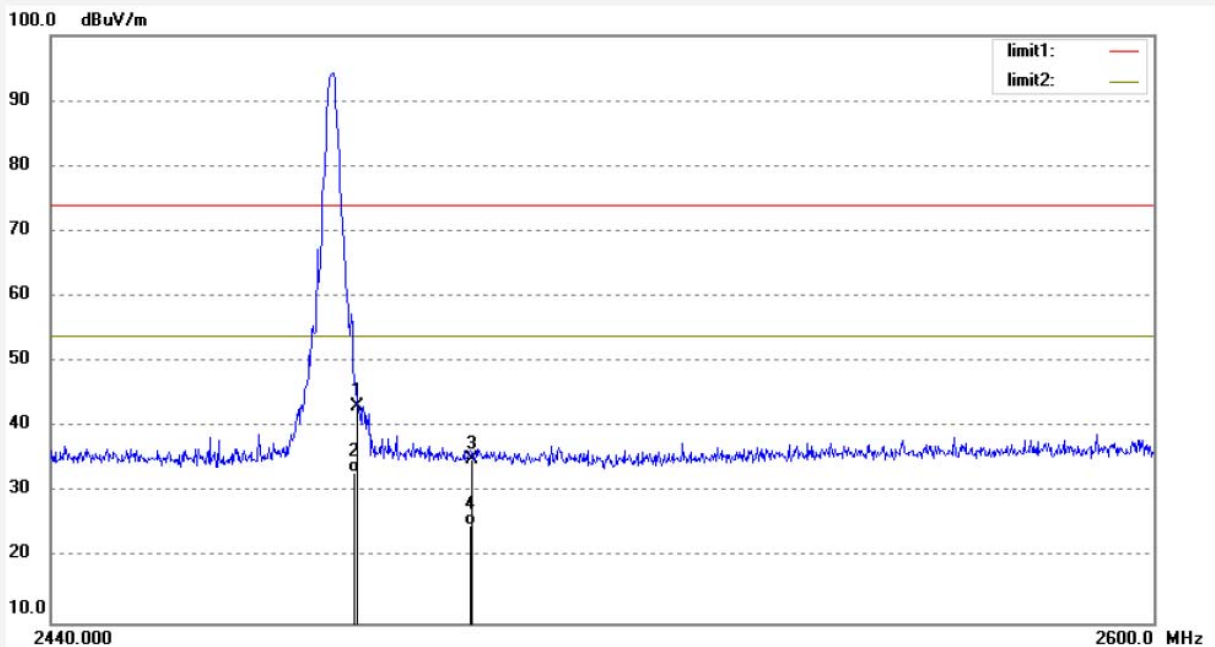
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,  
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber  
Tel:+86-0755-26503290  
Fax:+86-0755-26503396

Job No.: JPZRLK #49  
Standard: FCC PK  
Test item: Radiation Test  
Temp.( C)/Hum.(%) 25 C / 55 %  
EUT: True Wireless Earbuds  
Mode: TX 2480MHz  
Model: BE1028  
Manufacturer: Kinlan

Polarization: Horizontal  
Power Source: DC 3.7V  
Date: 19/09/19/  
Time: 9/44/08  
Engineer Signature: Ben  
Distance: 3m

Note: Report NO.:ATE20191376



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2483.500    | 48.97            | -5.89       | 43.08           | 74.00          | -30.92      | peak     | 200         | 123           |        |
| 2   | 2483.500    | 38.99            | -5.89       | 33.10           | 54.00          | -20.90      | AVG      | 200         | 165           |        |
| 3   | 2500.000    | 40.80            | -5.81       | 34.99           | 74.00          | -39.01      | peak     | 200         | 196           |        |
| 4   | 2500.000    | 30.81            | -5.81       | 25.00           | 54.00          | -29.00      | AVG      | 200         | 245           |        |

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



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Fax:+86-0755-26503396

Job No.: JPZRLK #48

Standard: FCC PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: True Wireless Earbuds

Mode: TX 2480MHz

Model: BE1028

Manufacturer: Kinlan

Polarization: Vertical

Power Source: DC 3.7V

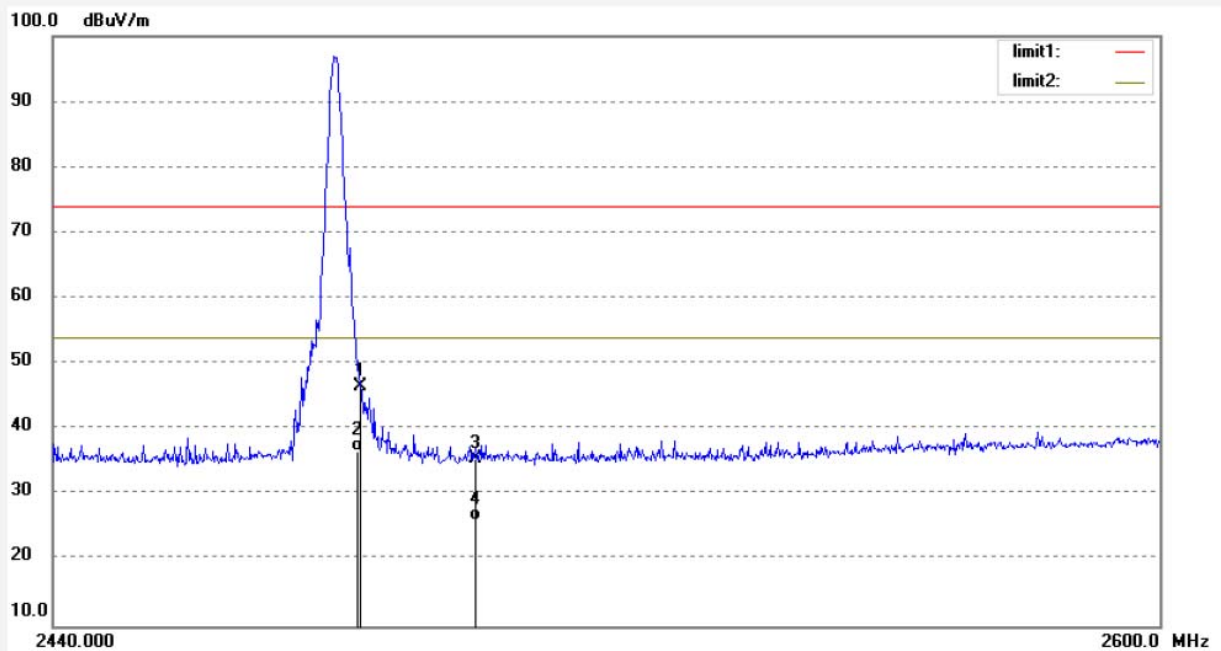
Date: 19/09/19/

Time: 9/41/50

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20191376



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2483.500    | 52.40            | -5.89       | 46.51           | 74.00          | -27.49      | peak     | 150         | 136           |        |
| 2   | 2483.500    | 42.49            | -5.89       | 36.60           | 54.00          | -17.40      | AVG      | 150         | 215           |        |
| 3   | 2500.000    | 41.36            | -5.81       | 35.55           | 74.00          | -38.45      | peak     | 150         | 186           |        |
| 4   | 2500.000    | 31.81            | -5.81       | 26.00           | 54.00          | -28.00      | AVG      | 150         | 296           |        |

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

## Hopping mode



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Fax:+86-0755-26503396

Job No.: JPZRLK #52

Standard: FCC PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: True Wireless Earbuds

Mode: HOPPING

Model: BE1028

Manufacturer: Kinlan

Polarization: Horizontal

Power Source: DC 3.7V

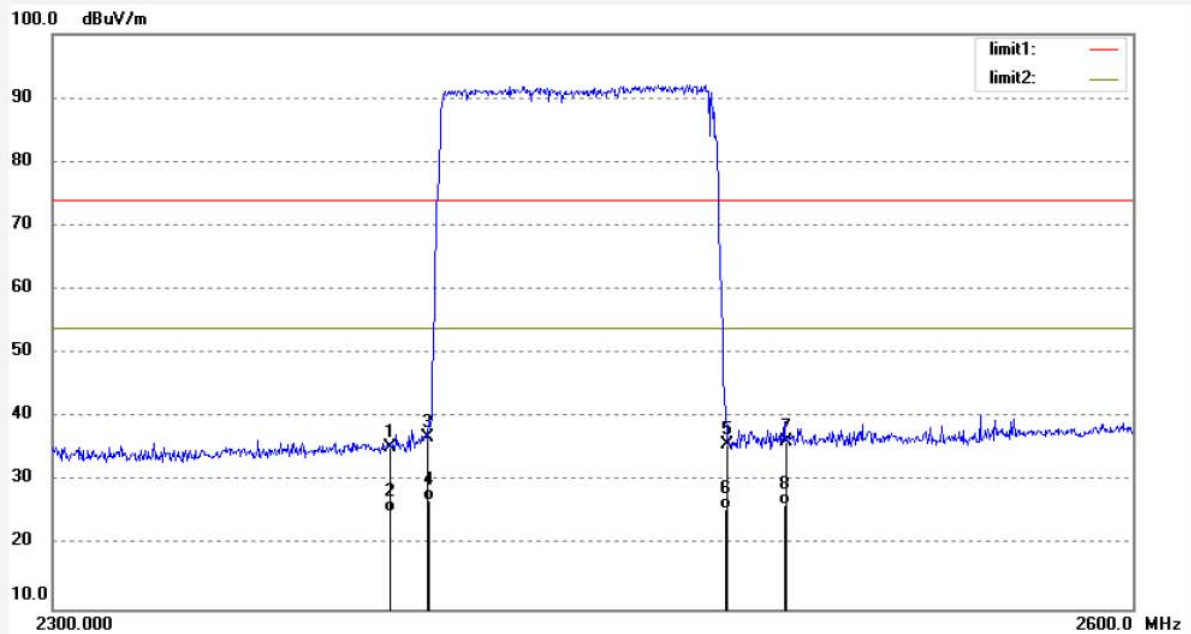
Date: 19/09/19/

Time: 9/52/26

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20191376



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2390.000    | 41.62            | -6.32       | 35.30           | 74.00          | -38.70      | peak     | 200         | 103           |        |
| 2   | 2390.000    | 31.62            | -6.32       | 25.30           | 54.00          | -28.70      | AVG      | 200         | 136           |        |
| 3   | 2400.000    | 43.12            | -6.27       | 36.85           | 74.00          | -37.15      | peak     | 200         | 156           |        |
| 4   | 2400.000    | 33.17            | -6.27       | 26.90           | 54.00          | -27.10      | AVG      | 200         | 196           |        |
| 5   | 2483.500    | 41.58            | -5.89       | 35.69           | 74.00          | -38.31      | peak     | 200         | 201           |        |
| 6   | 2483.500    | 31.59            | -5.89       | 25.70           | 54.00          | -28.30      | AVG      | 200         | 236           |        |
| 7   | 2500.000    | 42.05            | -5.81       | 36.24           | 74.00          | -37.76      | peak     | 200         | 269           |        |
| 8   | 2500.000    | 32.21            | -5.81       | 26.40           | 54.00          | -27.60      | AVG      | 200         | 302           |        |

Note: Average measurement with peak detection at No.2&4&6&8



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Site: 1# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: JPZRLK #53

Standard: FCC PK

Test item: Radiation Test

Temp.( C)/Hum.(%) 25 C / 55 %

EUT: True Wireless Earbuds

Mode: HOPPING

Model: BE1028

Manufacturer: Kinlan

Polarization: Vertical

Power Source: DC 3.7V

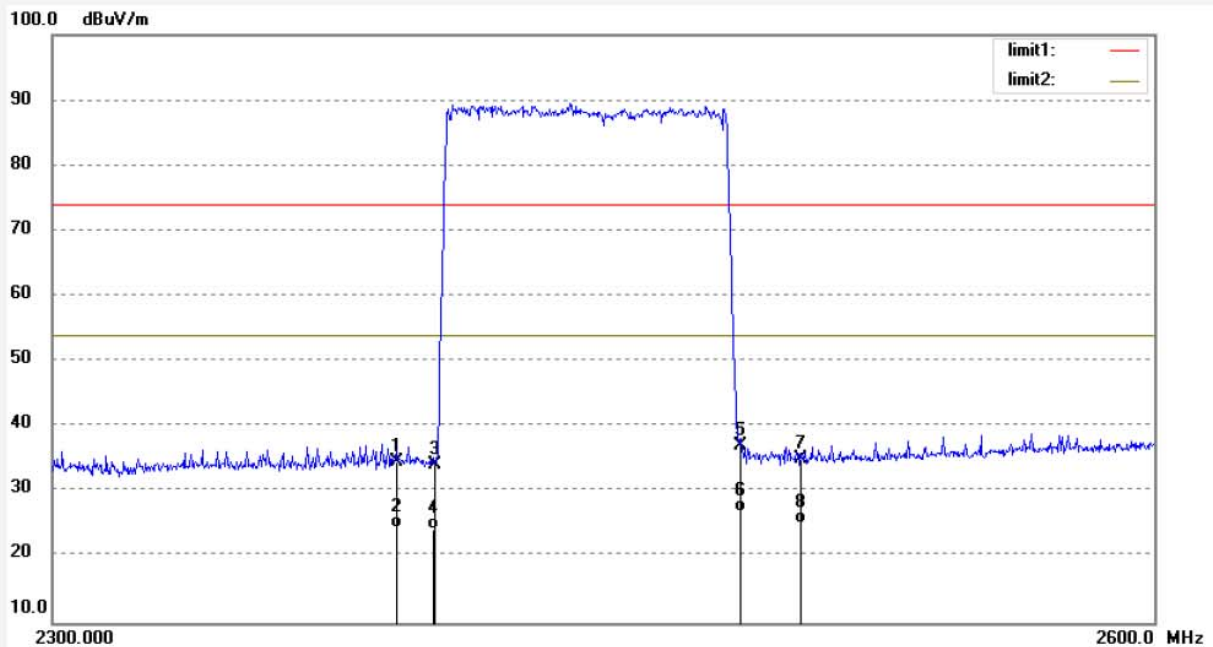
Date: 19/09/19/

Time: 9/57/34

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20191376



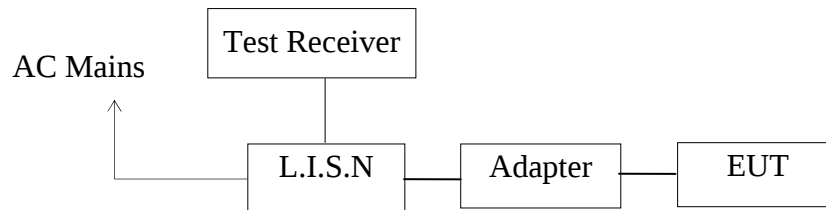
| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Degree (deg.) | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|-------------|---------------|--------|
| 1   | 2390.000    | 40.96            | -6.32       | 34.64           | 74.00          | -39.36      | peak     | 150         | 108           |        |
| 2   | 2390.000    | 30.92            | -6.32       | 24.60           | 54.00          | -29.40      | AVG      | 150         | 136           |        |
| 3   | 2400.000    | 40.53            | -6.27       | 34.26           | 74.00          | -39.74      | peak     | 150         | 186           |        |
| 4   | 2400.000    | 30.57            | -6.27       | 24.30           | 54.00          | -29.70      | AVG      | 150         | 196           |        |
| 5   | 2483.500    | 42.98            | -5.89       | 37.09           | 74.00          | -36.91      | peak     | 150         | 206           |        |
| 6   | 2483.500    | 32.98            | -5.89       | 27.09           | 54.00          | -26.91      | AVG      | 150         | 235           |        |
| 7   | 2500.000    | 40.98            | -5.81       | 35.17           | 74.00          | -38.83      | peak     | 150         | 256           |        |
| 8   | 2500.000    | 30.91            | -5.81       | 25.10           | 54.00          | -28.90      | AVG      | 150         | 305           |        |

Note: Average measurement with peak detection at No.2&4&6&8

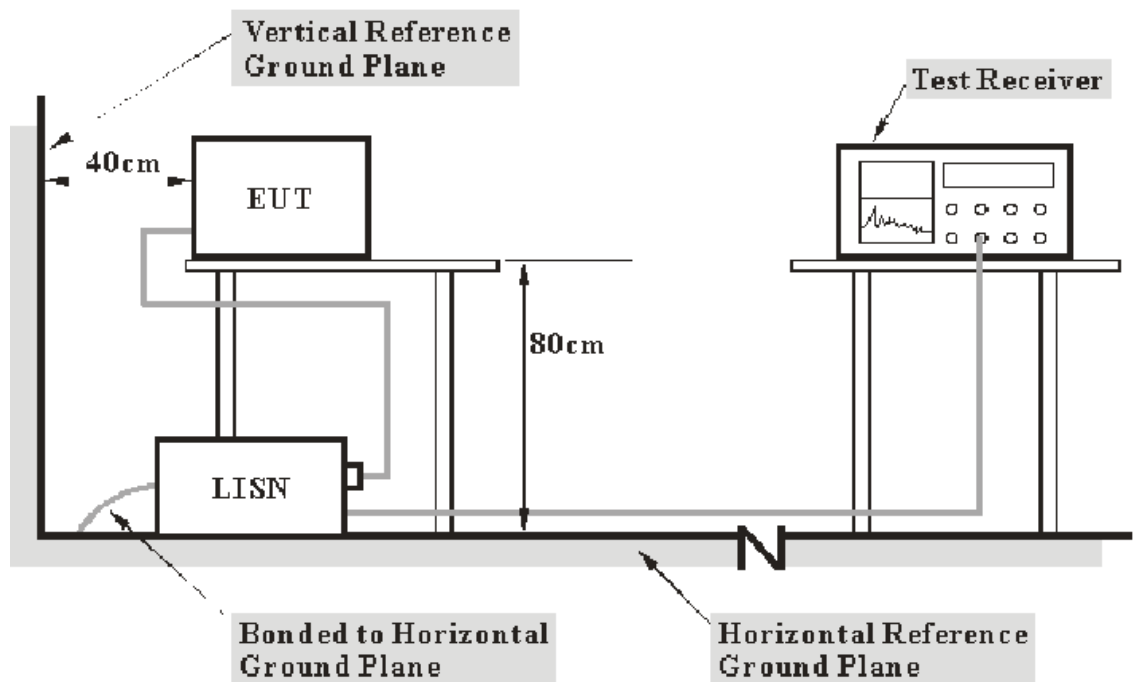
## 13.AC POWER LINE CONDUCTED EMISSION TEST

### 13.1.Block Diagram of Test Setup

#### 13.1.1.Block diagram of connection between the EUT and simulators



#### 13.1.2.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.

### 13.2.Power Line Conducted Emission Measurement Limits

| Frequency<br>(MHz)                                                                                       | Limit dB( $\mu$ V) |               |
|----------------------------------------------------------------------------------------------------------|--------------------|---------------|
|                                                                                                          | 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. |                    |               |

### 13.3.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.

### 13.4.Operating Condition of EUT

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

13.4.2.Turn on the power of all equipment.

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

### 13.5.Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10: 2013 on Conducted Emission Measurement.

The bandwidth of test receiver is set at 9kHz.

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

### 13.6.Data Sample

| Frequency<br>(MHz) | Transducer<br>value<br>(dB) | QuasiPeak<br>Level<br>(dBμV) | Average<br>Level<br>(dBμV) | QuasiPeak<br>Limit<br>(dBμV) | Average<br>Limit<br>(dBμV) | QuasiPeak<br>Margin<br>(dB) | Average<br>Margin<br>(dB) | Remark<br>(Pass/Fail) |
|--------------------|-----------------------------|------------------------------|----------------------------|------------------------------|----------------------------|-----------------------------|---------------------------|-----------------------|
| X.XX               | 10.6                        | 25.3                         | 17.0                       | 59.0                         | 49.0                       | 33.4                        | 31.7                      | Pass                  |

Frequency(MHz) = Emission frequency in MHz

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

Level(dBμV) = Quasi-peak Reading/Average Reading + Transducer value

Limit (dBμV) = Limit stated in standard

Margin = Limit (dBμV) - Level (dBμV)

Calculation Formula:

Margin = Limit (dBμV) - Level (dBμV)

### 13.7.Test Results

**Pass.**

Test Lab: 3m Anechoic chamber

Test Engineer: Ben

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.

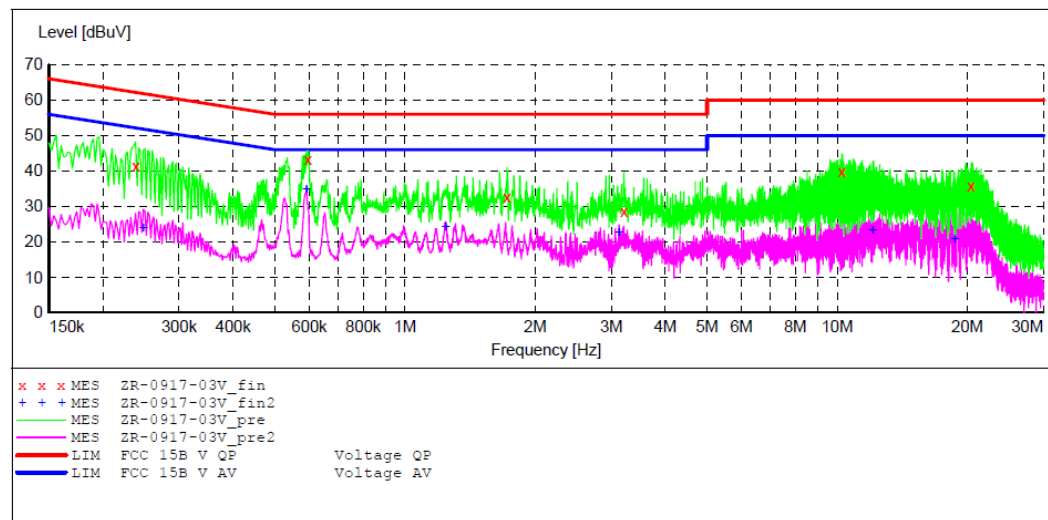
## ACCURATE TECHNOLOGY CO., LTD

### CONDUCTED EMISSION STANDARD FCC PART 15C

EUT: True Wireless Earbuds M/N:BE1028  
 Manufacturer: Kinlan  
 Operating Condition: BT Communication  
 Test Site: 2#Shielding Room  
 Operator: Ben  
 Test Specification: N 120V 60Hz  
 Comment: Report NO.:ATE20191376  
 Start of Test: 2019-9-17 / 17:59:25

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

Short Description: \_SUB\_STD\_VTERM2 1.70  
 Start Stop Step Detector Meas. IF Transducer  
 Frequency Frequency Width Time Bandw.  
 150.0 kHz 30.0 MHz 4.5 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008  
 Average



### MEASUREMENT RESULT: "ZR-0917-03V\_fin"

2019-9-17 18:01

| Frequency<br>MHz | Level<br>dBuV | Transd<br>dB | Limit<br>dBuV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.238000         | 41.40         | 10.9         | 62            | 20.8         | QP       | N    | GND |
| 0.596000         | 43.40         | 11.0         | 56            | 12.6         | QP       | N    | GND |
| 1.722000         | 32.80         | 11.2         | 56            | 23.2         | QP       | N    | GND |
| 3.210000         | 28.50         | 11.4         | 56            | 27.5         | QP       | N    | GND |
| 10.255000        | 39.70         | 11.6         | 60            | 20.3         | QP       | N    | GND |
| 20.405000        | 35.90         | 11.7         | 60            | 24.1         | QP       | N    | GND |

### MEASUREMENT RESULT: "ZR-0917-03V\_fin2"

2019-9-17 18:01

| Frequency<br>MHz | Level<br>dBuV | Transd<br>dB | Limit<br>dBuV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.248000         | 23.90         | 10.9         | 52            | 27.9         | AV       | N    | GND |
| 0.592000         | 34.70         | 11.0         | 46            | 11.3         | AV       | N    | GND |
| 1.242000         | 24.30         | 11.2         | 46            | 21.7         | AV       | N    | GND |
| 3.125000         | 22.60         | 11.3         | 46            | 23.4         | AV       | N    | GND |
| 12.075000        | 23.30         | 11.6         | 50            | 26.7         | AV       | N    | GND |
| 18.680000        | 20.70         | 11.7         | 50            | 29.3         | AV       | N    | GND |

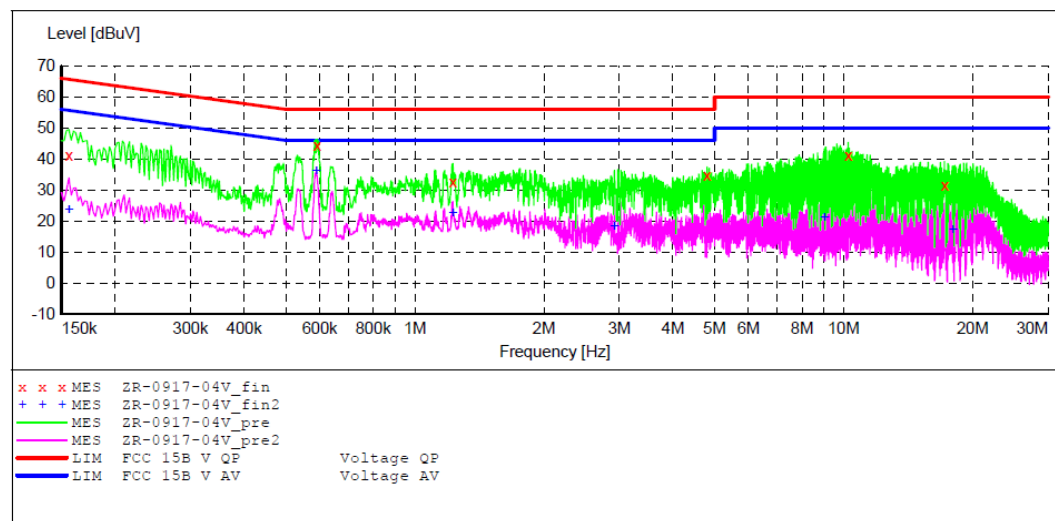
## ACCURATE TECHNOLOGY CO., LTD

### CONDUCTED EMISSION STANDARD FCC PART 15C

EUT: True Wireless Earbuds M/N:BE1028  
 Manufacturer: Kinlan  
 Operating Condition: BT Communication  
 Test Site: 2#Shielding Room  
 Operator: Ben  
 Test Specification: L 120V 60Hz  
 Comment: Report NO.:ATE20191376  
 Start of Test: 2019-9-17 / 18:01:44

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

Short Description: \_SUB\_STD\_VTERM2 1.70  
 Start Stop Step Detector Meas. IF Transducer  
 Frequency Frequency Width Time Bandw.  
 150.0 kHz 30.0 MHz 4.5 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008  
 Average



#### MEASUREMENT RESULT: "ZR-0917-04V\_fin"

2019-9-17 18:03

| Frequency<br>MHz | Level<br>dBuV | Transd<br>dB | Limit<br>dBuV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.156000         | 41.20         | 10.8         | 66            | 24.5         | QP       | L1   | GND |
| 0.592000         | 44.40         | 11.0         | 56            | 11.6         | QP       | L1   | GND |
| 1.226000         | 32.50         | 11.2         | 56            | 23.5         | QP       | L1   | GND |
| 4.805000         | 34.80         | 11.4         | 56            | 21.2         | QP       | L1   | GND |
| 10.255000        | 41.30         | 11.6         | 60            | 18.7         | QP       | L1   | GND |
| 17.185000        | 31.50         | 11.7         | 60            | 28.5         | QP       | L1   | GND |

#### MEASUREMENT RESULT: "ZR-0917-04V\_fin2"

2019-9-17 18:03

| Frequency<br>MHz | Level<br>dBuV | Transd<br>dB | Limit<br>dBuV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.156000         | 23.60         | 10.8         | 56            | 32.1         | AV       | L1   | GND |
| 0.590000         | 36.40         | 11.0         | 46            | 9.6          | AV       | L1   | GND |
| 1.226000         | 22.50         | 11.2         | 46            | 23.5         | AV       | L1   | GND |
| 2.920000         | 18.50         | 11.3         | 46            | 27.5         | AV       | L1   | GND |
| 9.020000         | 21.40         | 11.6         | 50            | 28.6         | AV       | L1   | GND |
| 17.985000        | 17.30         | 11.7         | 50            | 32.7         | AV       | L1   | GND |

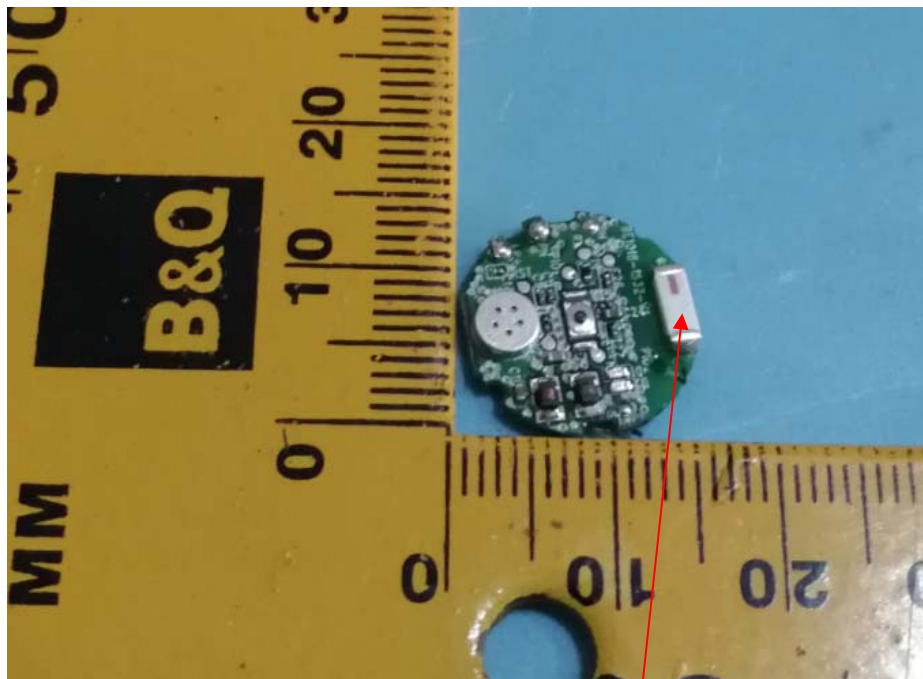
## 14.ANTENNA REQUIREMENT

### 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 1.0dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.



Antenna

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