

# FCC Test Report

Report No.: AGC02575190801FE03

**FCC ID** : 025BIT-1  
**APPLICATION PURPOSE** : Class II Equipment  
**PRODUCT DESIGNATION** : Bluetooth Helmet Headset  
**BRAND NAME** : ChatterBox  
**MODEL NAME** : BiT-1  
**APPLICANT** : Unimo Technology Co., Ltd.  
**DATE OF ISSUE** : Sep. 18, 2019  
**STANDARD(S)** : FCC Part 15.247  
**REPORT VERSION** : V1.0

## Attestation of Global Compliance (Shenzhen) Co., Ltd

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## REPORT REVISE RECORD

| Report Version | Revise Time | Issued Date   | Valid Version | Notes           |
|----------------|-------------|---------------|---------------|-----------------|
| V1.0           | /           | Sep. 18, 2019 | Valid         | Initial Release |

**Note:**

The original test report Ref.No. AGC02575180401FE04 dated May. 24, 2018, was modified on Sep. 18, 2019 to include the following changes:

Increase the protection circuit for the shutdown current and charging overvoltage. The Bluetooth part remains the same. So the Conducted Emission and Radiated Emission had been tested for the Class II device.



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## 1. VERIFICATION OF CONFORMITY

|                                 |                                                                      |
|---------------------------------|----------------------------------------------------------------------|
| <b>Applicant</b>                | Unimo Technology Co., Ltd.                                           |
| <b>Address</b>                  | 4th Floor, 162 Bangbae-Ro Seocho-Gu, Seoul, Korea, 06588 South Korea |
| <b>Manufacturer</b>             | Unimo Technology Co., Ltd.                                           |
| <b>Address</b>                  | 4th Floor, 162 Bangbae-Ro Seocho-Gu, Seoul, Korea, 06588 South Korea |
| <b>Factory</b>                  | Unimo Technology Co., Ltd.                                           |
| <b>Address</b>                  | 4th Floor, 162 Bangbae-Ro Seocho-Gu, Seoul, Korea, 06588 South Korea |
| <b>Product Designation</b>      | Bluetooth Helmet Headset                                             |
| <b>Brand Name</b>               | ChatterBox                                                           |
| <b>Test Model</b>               | BiT-1                                                                |
| <b>Date of test</b>             | Sep. 10, 2019 to Sep. 18, 2019                                       |
| <b>Deviation</b>                | None                                                                 |
| <b>Condition of Test Sample</b> | Normal                                                               |
| <b>Test Result</b>              | Pass                                                                 |
| <b>Report Template</b>          | AGCRT-US-BR/RF                                                       |

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC PART 15.247.

Prepared By



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Sep. 18, 2019

Reviewed By



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(Reviewer)

Sep. 18, 2019

Approved By



Forrest Lei  
(Authorized Officer)

Sep. 18, 2019

## 2. GENERAL INFORMATION

### 2.1. PRODUCT DESCRIPTION

The EUT is designed as “Bluetooth Helmet Headset”. It is designed by way of utilizing the GFSK, Pi/4 DQPSK and 8DPSK technology to achieve the system operation.

A major technical description of EUT is described as following

|                     |                                                                                                                                                                                                                           |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operation Frequency | 2.402 GHz to 2.480GHz                                                                                                                                                                                                     |
| RF Output Power     | 8.48dBm(Max)                                                                                                                                                                                                              |
| Bluetooth Version   | V 4.1                                                                                                                                                                                                                     |
| Modulation          | BR <input checked="" type="checkbox"/> GFSK, EDR <input checked="" type="checkbox"/> π /4-DQPSK, <input checked="" type="checkbox"/> 8DPSK<br>BLE <input type="checkbox"/> GFSK 1Mbps <input type="checkbox"/> GFSK 2Mbps |
| Number of channels  | 79                                                                                                                                                                                                                        |
| Hardware Version    | BiT-1 _V7                                                                                                                                                                                                                 |
| Software Version    | ChatterBox BiT-1 V66                                                                                                                                                                                                      |
| Antenna Designation | PCB Antenna(Comply with requirements of the FCC part 15.203)                                                                                                                                                              |
| Antenna Gain        | 0dBi                                                                                                                                                                                                                      |
| Power Supply        | DC 3.7V by battery or DC 5V by adapter                                                                                                                                                                                    |

### 2.2. TABLE OF CARRIER FREQUENCIES

| Frequency Band | Channel Number | Frequency |
|----------------|----------------|-----------|
| 2402~2480MHZ   | 0              | 2402MHZ   |
|                | 1              | 2403MHZ   |
|                | :              | :         |
|                | 38             | 2440 MHZ  |
|                | 39             | 2441 MHZ  |
|                | 40             | 2442 MHZ  |
|                | :              | :         |
|                | 77             | 2479 MHZ  |
|                | 78             | 2480 MHZ  |

### 2.3. RECEIVER INPUT BANDWIDTH

The input bandwidth of the receiver is 1.3MHz. In every connection one Bluetooth device is the master and the other one is slave. The master determines the hopping sequence. The slave follows this sequence. Both devices shift between RX and TX time slot according to the clock of the master. Additionally the type of connection (e.g. single or multislot packet) is set up at the beginning of the connection. The master adapts its hopping frequency and its TX/RX timing according to the packet type of the connection. Also the slave of the connection will use these settings.

Repeating of a packet has no influence on the hopping sequence. The hopping sequence generated by the master of the connection will be followed in any case. That means, a repeated packet will not be sent on the same frequency, it is sent on the next frequency of the hopping sequence.

### 2.4. EXAMPLE OF A HOPPING SEQUENCE IN DATA MODE

Example of a 79 hopping sequence in data mode:

40, 21, 44, 23, 42, 53, 46, 55, 48, 33, 52, 35, 50, 65, 54, 67  
56, 37, 60, 39, 58, 69, 62, 71, 64, 25, 68, 27, 66, 57, 70, 59  
72, 29, 76, 31, 74, 61, 78, 63, 01, 41, 05, 43, 03, 73, 07, 75  
09, 45, 13, 47, 11, 77, 15, 00, 64, 49, 66, 53, 68, 02, 70, 06  
01, 51, 03, 55, 05, 04

### 2.5. EQUALLY AVERAGE USE OF FREQUENCIES AND BEHAVIOUR

The generation of the hopping sequence in connection mode depends essentially on two input values:

1. LAP/UAP of the master of the connection.
2. Internal master clock

The LAP (lower address part) are the 24 LSB's of the 48 BD\_ADDRESS. The BD\_ADDRESS is an unambiguous number of every Bluetooth unit. The UAP (upper address part) are the 24 MSB's of the 48 BD\_ADDRESS.

The internal clock of a Bluetooth unit is derived from a free running clock which is never adjusted and is never turned off. For synchronization with other units only offset are used. It has no relation to the time of the day. Its resolution is at least half the RX/TX slot length of 312.5us. The clock has a cycle of about one day (23h30). In most cases it is implemented as 28 bit counter. For the deriving of the hopping sequence the entire LAP (24 bits), 4 LSB's (4 bits) (Input 1) and the 27 MSB's of the clock (Input 2) are used. With these input values different mathematical procedures (permutations, additions, XOR-operations) are performed to generate the Sequence. This will be done at the beginning of every new transmission.

Regarding short transmissions the Bluetooth system has the following behavior:

The first connection between the two devices is established, a hopping sequence was generated. For transmitting the wanted data the complete hopping sequence was not used. The connection ended. The second connection will be established. A new hopping sequence is generated. Due to the fact the Bluetooth clock has a different value, because the period between the two transmissions is longer (and it cannot be shorter) than the minimum resolution of the clock (312.5us). The hopping sequence will always differ from the first one.

## 2.6. RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: O25BIT-1** filing to comply with the FCC PART 15.247 requirements.

## 2.7. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10 (2013). Radiated testing was performed at an antenna to EUT distance 3 meters.

## 2.8. SPECIAL ACCESSORIES

Refer to section 5.2.

## 2.9. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.



### 3. MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$ , where expended uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95%.

- Uncertainty of Conducted Emission,  $U_c = \pm 3.2$  dB
- Uncertainty of Radiated Emission below 1GHz,  $U_c = \pm 3.9$  dB
- Uncertainty of Radiated Emission above 1GHz,  $U_c = \pm 4.8$  dB
- Uncertainty of total RF power, conducted,  $U_c = \pm 0.8$  dB
- Uncertainty of spurious emissions, conducted,  $U_c = \pm 2.7$  dB
- Uncertainty of Occupied Channel Bandwidth:  $U_c = \pm 2$  %
- Uncertainty of Dwell Time:  $U_c = \pm 2$  %
- Uncertainty of Frequency:  $U_c = \pm 2$  %



#### 4. DESCRIPTION OF TEST MODES

| NO. | TEST MODE DESCRIPTION         |
|-----|-------------------------------|
| 1   | Low channel GFSK              |
| 2   | Middle channel GFSK           |
| 3   | High channel GFSK             |
| 4   | Low channel $\pi/4$ -DQPSK    |
| 5   | Middle channel $\pi/4$ -DQPSK |
| 6   | High channel $\pi/4$ -DQPSK   |
| 7   | Low channel 8DPSK             |
| 8   | Middle channel 8DPSK          |
| 9   | High channel 8DPSK            |
| 10  | Hopping mode GFSK             |
| 11  | Hopping mode $\pi/4$ -DQPSK   |
| 12  | Hopping mode 8DPSK            |

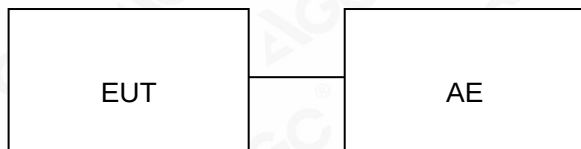
Note:

1. Only the result of the worst case was recorded in the report, if no other cases.
2. For Radiated Emission, 3axis were chosen for testing for each applicable mode.
3. For Conducted Test method, a temporary antenna connector is provided by the manufacture.
4. The test software is the BlueTest3 which can set the EUT into the individual test modes.

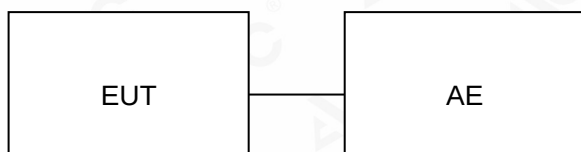
## 5. SYSTEM TEST CONFIGURATION

### 5.1. CONFIGURATION OF EUT SYSTEM

Radiated Emission Configure :



Conducted Emission Configure :



### 5.2 EQUIPMENT USED IN TESTED SYSTEM

| Item | Equipment                | Model No.     | ID or    | Remark |
|------|--------------------------|---------------|----------|--------|
| 1    | Bluetooth Helmet Headset | BiT-1         | O25BIT-1 | EUT    |
| 2    | Adapter                  | SOY-0500100US | DC 5V/1A | AE     |
| 3    | Smart phone              | P8            | N/A      | AE     |
| 4    | Charger line             | YH-005-VDE    | 1m       | AE     |
| 5    | MIC                      | ChatterBox    | 0.4m     | AE     |
| 6    | Speaker                  | ChatterBox    | N/A      | AE     |

### 5.3. SUMMARY OF TEST RESULTS

| FCC RULES | DESCRIPTION OF TEST | RESULT    |
|-----------|---------------------|-----------|
| 15.209    | Radiated Emission   | Compliant |
| 15.207    | Conducted Emission  | Compliant |



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## 6. TEST FACILITY

|                                          |                                                                                                                                          |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Test Site</b>                         | Attestation of Global Compliance (Shenzhen) Co., Ltd                                                                                     |
| <b>Location</b>                          | 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China |
| <b>Designation Number</b>                | CN1259                                                                                                                                   |
| <b>FCC Test Firm Registration Number</b> | 975832                                                                                                                                   |
| <b>A2LA Cert. No.</b>                    | 5054.02                                                                                                                                  |
| <b>Description</b>                       | Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by A2LA                                                                |

### TEST EQUIPMENT OF CONDUCTED EMISSION TEST

| Equipment     | Manufacturer | Model   | S/N    | Cal. Date     | Cal. Due      |
|---------------|--------------|---------|--------|---------------|---------------|
| TEST RECEIVER | R&S          | ESPI    | 101206 | Jun. 12, 2019 | Jun. 11, 2020 |
| LISN          | R&S          | ESH2-Z5 | 100086 | Aug. 26, 2019 | Aug. 25, 2020 |

### TEST EQUIPMENT OF RADIATED EMISSION TEST

| Equipment                      | Manufacturer   | Model        | S/N        | Cal. Date     | Cal. Due      |
|--------------------------------|----------------|--------------|------------|---------------|---------------|
| TEST RECEIVER                  | R&S            | ESCI         | 10096      | Jun. 12, 2019 | Jun. 26, 2020 |
| EXA Signal Analyzer            | Aglient        | N9010A       | MY53470504 | Dec. 20, 2018 | Dec. 19, 2019 |
| 2.4GHz Fliter                  | EM Electronics | 2400-2500MHz | N/A        | Feb. 27, 2019 | Feb. 26, 2020 |
| Attenuator                     | ZHINAN         | E-002        | N/A        | Aug. 26, 2019 | Aug. 25, 2020 |
| Horn antenna                   | SCHWARZBECK    | BBHA 9170    | #768       | Jun. 12, 2019 | Jun. 26, 2020 |
| Active loop antenna (9K-30MHz) | ZHINAN         | ZN30900C     | 18051      | Jun. 14, 2018 | Jun. 13, 2020 |
| Double-Ridged Waveguide Horn   | ETS LINDGREN   | 3117         | 00034609   | May. 26, 2018 | May. 25, 2020 |
| Broadband Preamplifier         | ETS LINDGREN   | 3117PA       | 00225134   | Oct. 25, 2018 | Oct. 24, 2019 |
| ANTENNA                        | SCHWARZBECK    | VULB9168     | D69250     | Sep. 28, 2017 | Sep. 27, 2019 |

## 7. RADIATED EMISSION

### 7.1. MEASUREMENT PROCEDURE

1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz RBW and 3MHz VBW for peak reading. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

The following table is the setting of spectrum analyzer and receiver.

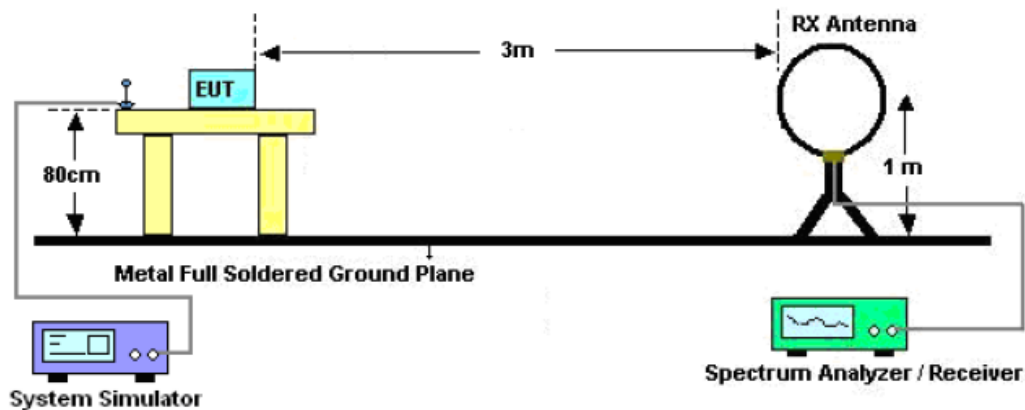
| Spectrum Parameter    | Setting                                                   |
|-----------------------|-----------------------------------------------------------|
| Start ~Stop Frequency | 9KHz~150KHz/RB 200Hz for QP                               |
| Start ~Stop Frequency | 150KHz~30MHz/RB 9KHz for QP                               |
| Start ~Stop Frequency | 30MHz~1000MHz/RB 120KHz for QP                            |
| Start ~Stop Frequency | 1GHz~26.5GHz<br>1MHz/3MHz for Peak, 1MHz/3MHz for Average |

| Receiver Parameter    | Setting                        |
|-----------------------|--------------------------------|
| Start ~Stop Frequency | 9KHz~150KHz/RB 200Hz for QP    |
| Start ~Stop Frequency | 150KHz~30MHz/RB 9KHz for QP    |
| Start ~Stop Frequency | 30MHz~1000MHz/RB 120KHz for QP |

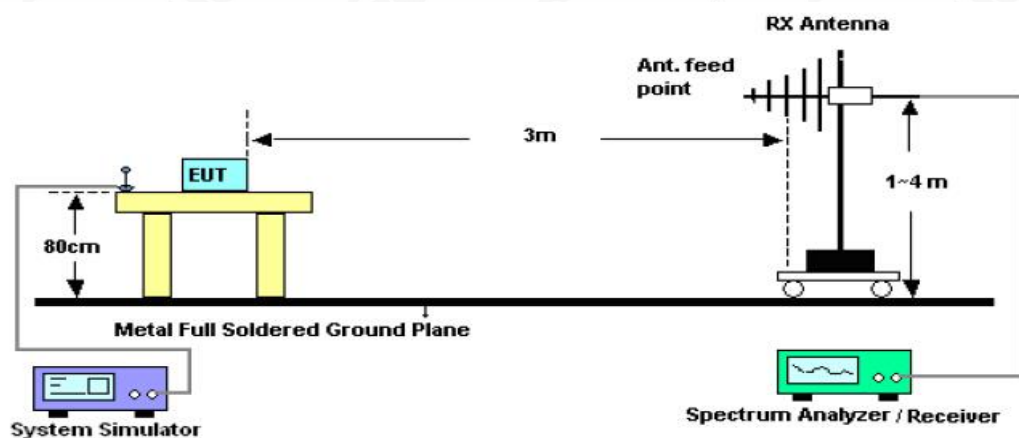


## 7.2. TEST SETUP

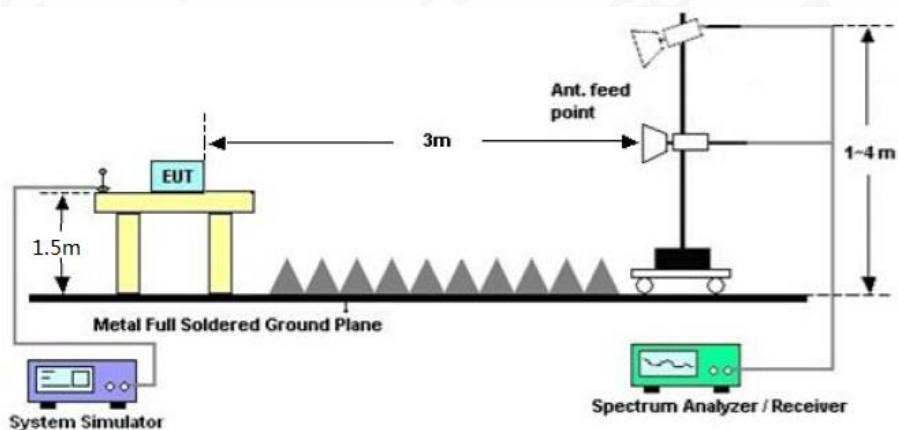
### Radiated Emission Test-Setup Frequency Below 30MHz



### RADIATED EMISSION TEST SETUP 30MHz-1000MHz



### RADIATED EMISSION TEST SETUP ABOVE 1000MHz



### 7.3. LIMITS AND MEASUREMENT RESULT

15.209 Limit in the below table has to be followed

| Frequencies<br>(MHz) | Field Strength<br>(micorvolts/meter) | Measurement Distance<br>(meters) |
|----------------------|--------------------------------------|----------------------------------|
| 0.009~0.490          | 2400/F(KHz)                          | 300                              |
| 0.490~1.705          | 24000/F(KHz)                         | 30                               |
| 1.705~30.0           | 30                                   | 30                               |
| 30~88                | 100                                  | 3                                |
| 88~216               | 150                                  | 3                                |
| 216~960              | 200                                  | 3                                |
| Above 960            | 500                                  | 3                                |

Note: All modes were tested For restricted band radiated emission,  
the test records reported below are the worst result compared to other modes.

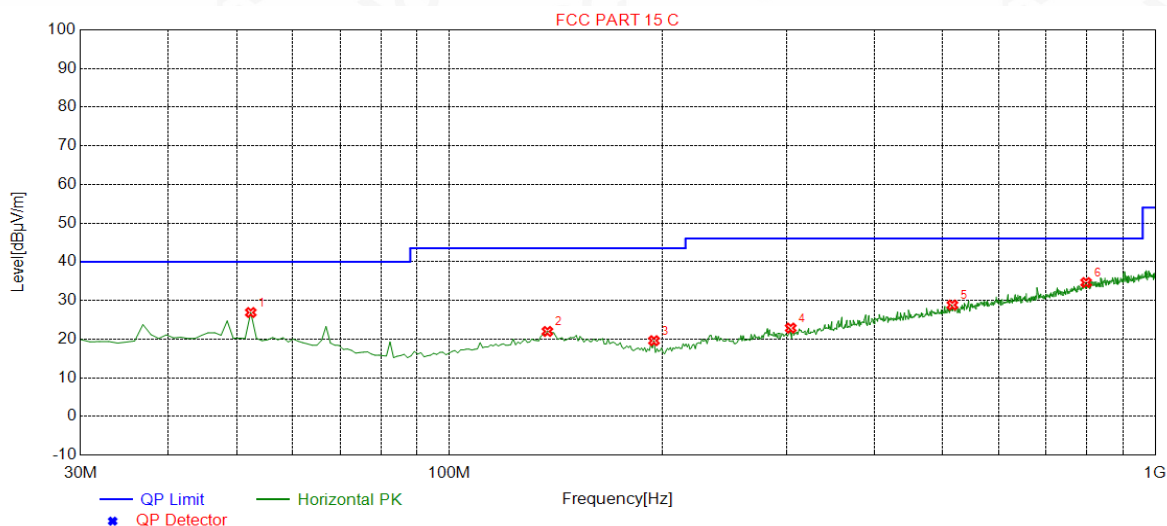
### 7.4. TEST RESULT

#### RADIATED EMISSION BELOW 30MHZ

No emission found between lowest internal used/generated frequencies to 30MHz.

### RADIATED EMISSION BELOW 1GHZ

|             |                          |                   |                |
|-------------|--------------------------|-------------------|----------------|
| EUT         | Bluetooth Helmet Headset | Model Name        | BiT-1          |
| Temperature | 25°C                     | Relative Humidity | 55.4%          |
| Pressure    | 960hPa                   | Test Voltage      | Normal Voltage |
| Test Mode   | Mode 4                   | Antenna           | Horizontal     |



| NO. | Freq. [MHz] | Level [dBμV/m] | Factor [dB] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity   |
|-----|-------------|----------------|-------------|----------------|-------------|-------------|-----------|------------|
| 1   | 52.3100     | 26.87          | 14.49       | 40.00          | 13.13       | 150         | 0         | Horizontal |
| 2   | 137.6700    | 21.97          | 14.71       | 43.50          | 21.53       | 150         | 205       | Horizontal |
| 3   | 194.9000    | 19.58          | 12.29       | 43.50          | 23.92       | 100         | 211       | Horizontal |
| 4   | 304.5100    | 22.85          | 16.07       | 46.00          | 23.15       | 150         | 87        | Horizontal |
| 5   | 515.9700    | 28.81          | 22.51       | 46.00          | 17.19       | 100         | 203       | Horizontal |
| 6   | 798.2400    | 34.62          | 28.47       | 46.00          | 11.38       | 100         | 164       | Horizontal |

**RESULT: PASS**



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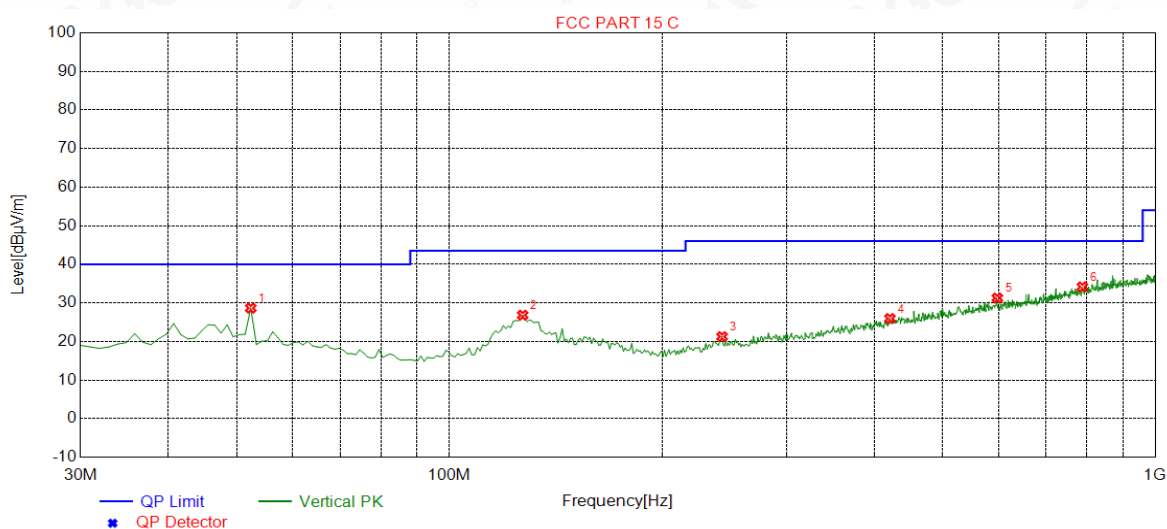
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|             |                          |                   |                |
|-------------|--------------------------|-------------------|----------------|
| EUT         | Bluetooth Helmet Headset | Model Name        | BiT-1          |
| Temperature | 25°C                     | Relative Humidity | 55.4%          |
| Pressure    | 960hPa                   | Test Voltage      | Normal Voltage |
| Test Mode   | Mode 4                   | Antenna           | Vertical       |



| NO. | Freq. [MHz] | Level [dBμV/m] | Factor [dB] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
|-----|-------------|----------------|-------------|----------------|-------------|-------------|-----------|----------|
| 1   | 52.3100     | 28.64          | 14.49       | 40.00          | 11.36       | 100         | 249       | Vertical |
| 2   | 127.0000    | 26.81          | 13.95       | 43.50          | 16.69       | 100         | 99        | Vertical |
| 3   | 243.4000    | 21.26          | 14.80       | 46.00          | 24.74       | 100         | 44        | Vertical |
| 4   | 420.9100    | 25.94          | 20.28       | 46.00          | 20.06       | 100         | 344       | Vertical |
| 5   | 597.4500    | 31.26          | 24.28       | 46.00          | 14.74       | 100         | 357       | Vertical |
| 6   | 788.5400    | 34.16          | 28.20       | 46.00          | 11.84       | 100         | 131       | Vertical |

## RESULT: PASS

**Note:** 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

2. All test modes had been pre-tested. The mode 4 is the worst case and recorded in the report.

### RADIATED EMISSION ABOVE 1GHZ

|                    |                          |                          |                |
|--------------------|--------------------------|--------------------------|----------------|
| <b>EUT</b>         | Bluetooth Helmet Headset | <b>Model Name</b>        | BiT-1          |
| <b>Temperature</b> | 25°C                     | <b>Relative Humidity</b> | 55.4%          |
| <b>Pressure</b>    | 960hPa                   | <b>Test Voltage</b>      | Normal Voltage |
| <b>Test Mode</b>   | Mode 1                   | <b>Antenna</b>           | Horizontal     |

| Frequency<br>(MHz) | Meter Reading<br>(dBμV) | Factor<br>(dB) | Emission Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Value Type |
|--------------------|-------------------------|----------------|----------------------------|--------------------|----------------|------------|
| 4804.000           | 48.07                   | 0.08           | 48.15                      | 74                 | -25.85         | peak       |
| 4804.000           | 42.45                   | 0.08           | 42.53                      | 54                 | -11.47         | AVG        |
| 7206.000           | 41.58                   | 2.21           | 43.79                      | 74                 | -30.21         | peak       |
| 7206.000           | 34.69                   | 2.21           | 36.9                       | 54                 | -17.1          | AVG        |
|                    |                         |                |                            |                    |                |            |
|                    |                         |                |                            |                    |                |            |

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

|                    |                          |                          |                |
|--------------------|--------------------------|--------------------------|----------------|
| <b>EUT</b>         | Bluetooth Helmet Headset | <b>Model Name</b>        | BiT-1          |
| <b>Temperature</b> | 25°C                     | <b>Relative Humidity</b> | 55.4%          |
| <b>Pressure</b>    | 960hPa                   | <b>Test Voltage</b>      | Normal Voltage |
| <b>Test Mode</b>   | Mode 1                   | <b>Antenna</b>           | Vertical       |

| Frequency<br>(MHz) | Meter Reading<br>(dBμV) | Factor<br>(dB) | Emission Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Value Type |
|--------------------|-------------------------|----------------|----------------------------|--------------------|----------------|------------|
| 4804.000           | 46.37                   | 0.08           | 46.45                      | 74                 | -27.55         | peak       |
| 4804.000           | 40.24                   | 0.08           | 40.32                      | 54                 | -13.68         | AVG        |
| 7206.000           | 37.89                   | 2.21           | 40.1                       | 74                 | -33.9          | peak       |
| 7206.000           | 31.89                   | 2.21           | 34.1                       | 54                 | -19.9          | AVG        |
|                    |                         |                |                            |                    |                |            |
|                    |                         |                |                            |                    |                |            |

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

|                    |                          |                          |                |
|--------------------|--------------------------|--------------------------|----------------|
| <b>EUT</b>         | Bluetooth Helmet Headset | <b>Model Name</b>        | BiT-1          |
| <b>Temperature</b> | 25°C                     | <b>Relative Humidity</b> | 55.4%          |
| <b>Pressure</b>    | 960hPa                   | <b>Test Voltage</b>      | Normal Voltage |
| <b>Test Mode</b>   | Mode 2                   | <b>Antenna</b>           | Horizontal     |

| Frequency<br>(MHz) | Meter Reading<br>(dBμV) | Factor<br>(dB) | Emission Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Value Type |
|--------------------|-------------------------|----------------|----------------------------|--------------------|----------------|------------|
| 4882.000           | 48.59                   | 0.14           | 48.73                      | 74                 | -25.27         | peak       |
| 4882.000           | 42.36                   | 0.14           | 42.5                       | 54                 | -11.5          | AVG        |
| 7323.000           | 41.86                   | 2.36           | 44.22                      | 74                 | -29.78         | peak       |
| 7323.000           | 35.86                   | 2.36           | 38.22                      | 54                 | -15.78         | AVG        |
|                    |                         |                |                            |                    |                |            |

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

|                    |                          |                          |                |
|--------------------|--------------------------|--------------------------|----------------|
| <b>EUT</b>         | Bluetooth Helmet Headset | <b>Model Name</b>        | BiT-1          |
| <b>Temperature</b> | 25°C                     | <b>Relative Humidity</b> | 55.4%          |
| <b>Pressure</b>    | 960hPa                   | <b>Test Voltage</b>      | Normal Voltage |
| <b>Test Mode</b>   | Mode 2                   | <b>Antenna</b>           | Vertical       |

| Frequency<br>(MHz) | Meter Reading<br>(dBμV) | Factor<br>(dB) | Emission Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Value Type |
|--------------------|-------------------------|----------------|----------------------------|--------------------|----------------|------------|
| 4882.000           | 46.79                   | 0.14           | 46.93                      | 74                 | -27.07         | peak       |
| 4882.000           | 40.26                   | 0.14           | 40.4                       | 54                 | -13.6          | AVG        |
| 7323.000           | 40.12                   | 2.36           | 42.48                      | 74                 | -31.52         | peak       |
| 7323.000           | 33.45                   | 2.36           | 35.81                      | 54                 | -18.19         | AVG        |
|                    |                         |                |                            |                    |                |            |

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

|                    |                          |                          |                |
|--------------------|--------------------------|--------------------------|----------------|
| <b>EUT</b>         | Bluetooth Helmet Headset | <b>Model Name</b>        | BiT-1          |
| <b>Temperature</b> | 25°C                     | <b>Relative Humidity</b> | 55.4%          |
| <b>Pressure</b>    | 960hPa                   | <b>Test Voltage</b>      | Normal Voltage |
| <b>Test Mode</b>   | Mode 3                   | <b>Antenna</b>           | Horizontal     |

| Frequency<br>(MHz) | Meter Reading<br>(dBμV) | Factor<br>(dB) | Emission Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Value Type |
|--------------------|-------------------------|----------------|----------------------------|--------------------|----------------|------------|
| 4960.000           | 48.71                   | 0.22           | 48.93                      | 74                 | -25.07         | peak       |
| 4960.000           | 41.97                   | 0.22           | 42.19                      | 54                 | -11.81         | AVG        |
| 7440.000           | 40.76                   | 2.64           | 43.4                       | 74                 | -30.6          | peak       |
| 7440.000           | 34.32                   | 2.64           | 36.96                      | 54                 | -17.04         | AVG        |
|                    |                         |                |                            |                    |                |            |

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

|                    |                          |                          |                |
|--------------------|--------------------------|--------------------------|----------------|
| <b>EUT</b>         | Bluetooth Helmet Headset | <b>Model Name</b>        | BiT-1          |
| <b>Temperature</b> | 25°C                     | <b>Relative Humidity</b> | 55.4%          |
| <b>Pressure</b>    | 960hPa                   | <b>Test Voltage</b>      | Normal Voltage |
| <b>Test Mode</b>   | Mode 3                   | <b>Antenna</b>           | Vertical       |

| Frequency<br>(MHz) | Meter Reading<br>(dBμV) | Factor<br>(dB) | Emission Level<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) | Value Type |
|--------------------|-------------------------|----------------|----------------------------|--------------------|----------------|------------|
| 4960.000           | 46.24                   | 0.22           | 46.46                      | 74                 | -27.54         | peak       |
| 4960.000           | 39.45                   | 0.22           | 39.67                      | 54                 | -14.33         | AVG        |
| 7440.000           | 38.25                   | 2.64           | 40.89                      | 74                 | -33.11         | peak       |
| 7440.000           | 31.74                   | 2.64           | 34.38                      | 54                 | -19.62         | AVG        |
|                    |                         |                |                            |                    |                |            |

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

## RESULT: PASS

### Note:

Other emissions from 1G to 25 GHz are considered as ambient noise. No recording in the test report.

Factor = Antenna Factor + Cable loss - Amplifier gain, Over=Measure-Limit.

The “Factor” value can be calculated automatically by software of measurement system.

All test modes had been tested. The GFSK modulation is the worst case and recorded in the report.

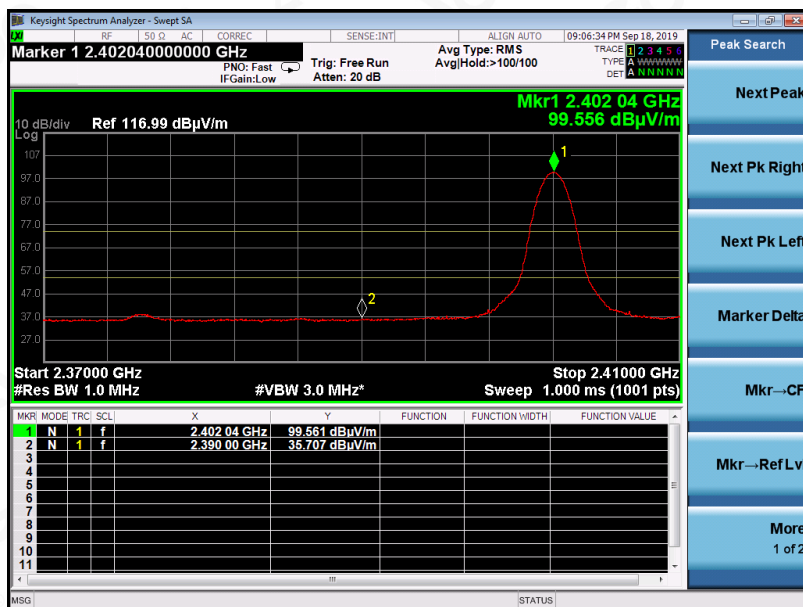
### TEST RESULT FOR RESTRICTED BANDS REQUIREMENTS

|             |                          |                   |                |
|-------------|--------------------------|-------------------|----------------|
| EUT         | Bluetooth Helmet Headset | Model Name        | BiT-1          |
| Temperature | 25°C                     | Relative Humidity | 55.4%          |
| Pressure    | 960hPa                   | Test Voltage      | Normal Voltage |
| Test Mode   | Mode 1                   | Antenna           | Horizontal     |

PK



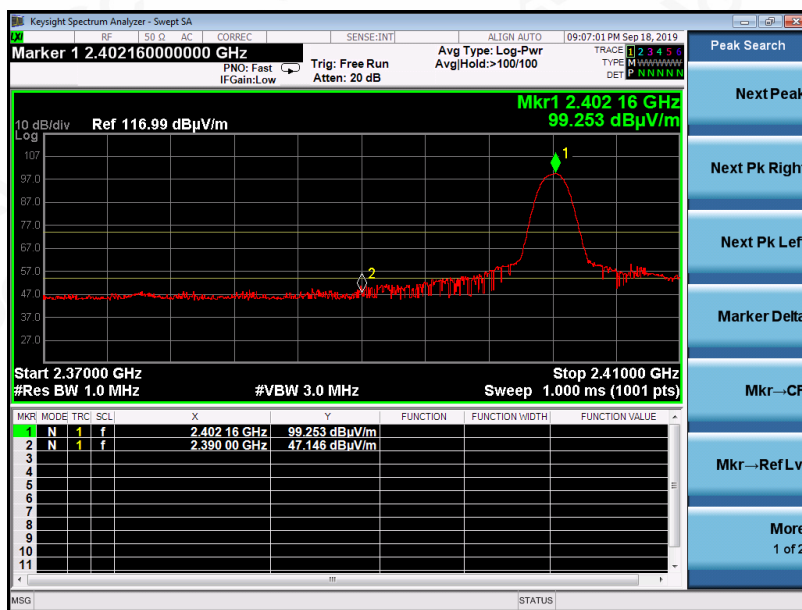
AV



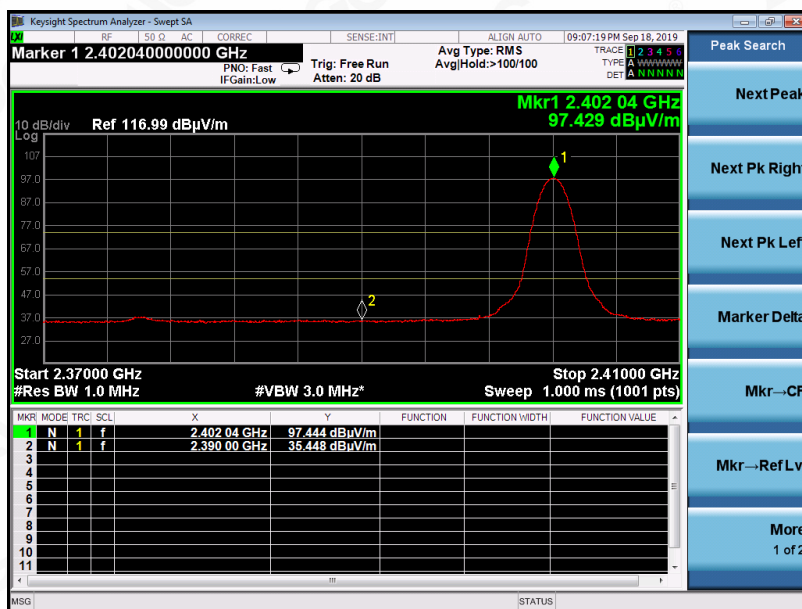
RESULT: PASS

|             |                          |                   |                |
|-------------|--------------------------|-------------------|----------------|
| EUT         | Bluetooth Helmet Headset | Model Name        | BiT-1          |
| Temperature | 25°C                     | Relative Humidity | 55.4%          |
| Pressure    | 960hPa                   | Test Voltage      | Normal Voltage |
| Test Mode   | Mode 1                   | Antenna           | Vertical       |

PK



AV



RESULT: PASS

|             |                          |                   |                |
|-------------|--------------------------|-------------------|----------------|
| EUT         | Bluetooth Helmet Headset | Model Name        | BiT-1          |
| Temperature | 25°C                     | Relative Humidity | 55.4%          |
| Pressure    | 960hPa                   | Test Voltage      | Normal Voltage |
| Test Mode   | Mode 3                   | Antenna           | Horizontal     |

PK



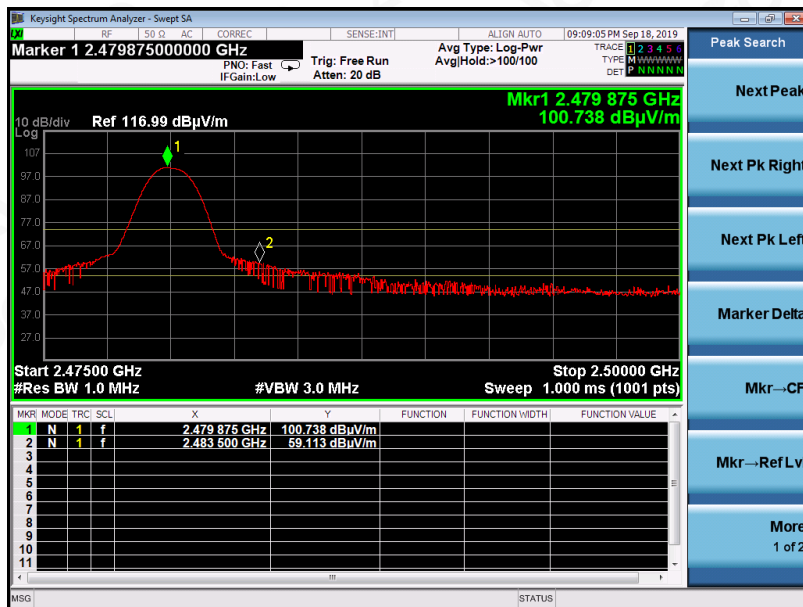
AV



RESULT: PASS

|             |                          |                   |                |
|-------------|--------------------------|-------------------|----------------|
| EUT         | Bluetooth Helmet Headset | Model Name        | BiT-1          |
| Temperature | 25°C                     | Relative Humidity | 55.4%          |
| Pressure    | 960hPa                   | Test Voltage      | Normal Voltage |
| Test Mode   | Mode 3                   | Antenna           | Vertical       |

PK



AV



## RESULT: PASS

**Note:** The factor had been edited in the "Input Correction" of the Spectrum Analyzer. So the Amplitude of test plots is equal to Reading level plus the Factor in dB. Use the A dB(μV) to represent the Amplitude. Use the F dB(μV/m) to represent the Field Strength. So A=F. All test modes had been pre-tested. The GFSK modulation is the worst case and recorded in the report.



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## 8. FCC LINE CONDUCTED EMISSION TEST

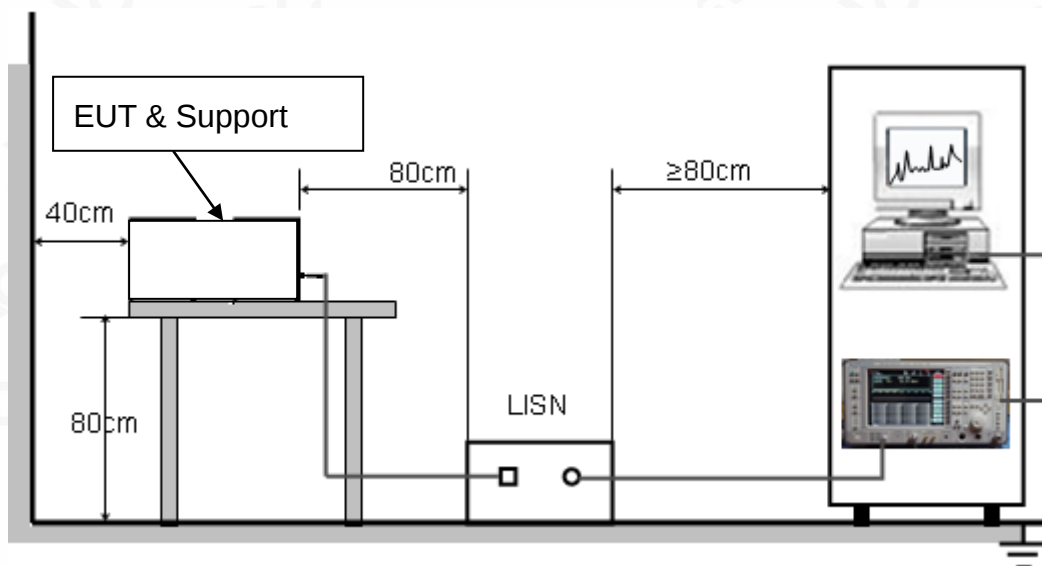
### 8.1. LIMITS OF LINE CONDUCTED EMISSION TEST

| Frequency     | Maximum RF Line Voltage |                |
|---------------|-------------------------|----------------|
|               | Q.P.( dBuV)             | Average( dBuV) |
| 150kHz~500kHz | 66-56                   | 56-46          |
| 500kHz~5MHz   | 56                      | 46             |
| 5MHz~30MHz    | 60                      | 50             |

Note:

1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

### 8.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



### 8.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2. Support equipment, if needed, was placed as per ANSI C63.10.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4. All support equipments received AC120V/60Hz power from a LISN, if any.
5. The EUT received DC 5V power from adapter which received AC120V/60Hz power from a LISN.
6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.
9. The test mode(s) were scanned during the preliminary test.

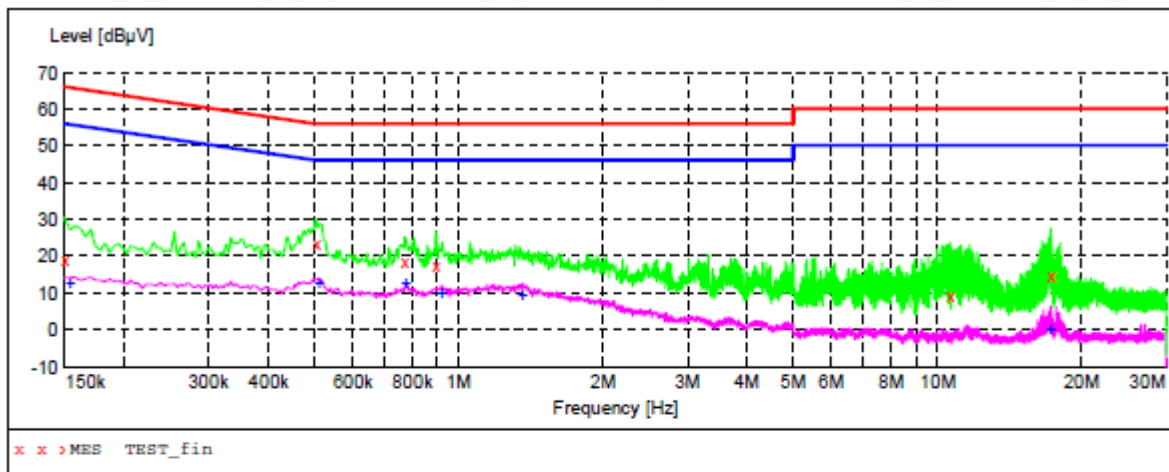
Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

### 8.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less -2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
3. The test data of the worst case condition(s) was reported on the Summary Data page.

## 8.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

### Line Conducted Emission Test Line 1-L



#### MEASUREMENT RESULT: "TEST\_fin"

9/12/2019 12:27AM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.150000         | 19.10         | 10.8         | 66            | 46.9         | QP       | L1   | FLO |
| 0.502000         | 23.30         | 11.2         | 56            | 32.7         | QP       | L1   | FLO |
| 0.770000         | 18.50         | 10.6         | 56            | 37.5         | QP       | L1   | FLO |
| 0.894000         | 17.50         | 11.1         | 56            | 38.5         | QP       | L1   | FLO |
| 10.598000        | 9.50          | 11.9         | 60            | 50.5         | QP       | L1   | FLO |
| 17.242000        | 14.80         | 12.3         | 60            | 45.2         | QP       | L1   | FLO |

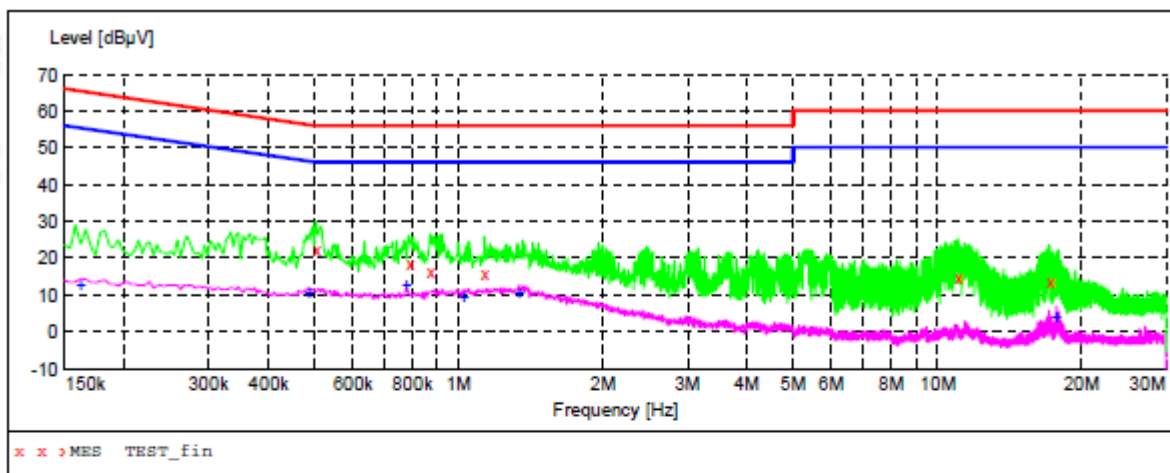
#### MEASUREMENT RESULT: "TEST\_fin2"

9/12/2019 12:27AM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.154000         | 13.30         | 10.8         | 56            | 42.5         | AV       | L1   | FLO |
| 0.510000         | 13.40         | 11.1         | 46            | 32.6         | AV       | L1   | FLO |
| 0.774000         | 13.00         | 10.6         | 46            | 33.0         | AV       | L1   | FLO |
| 0.922000         | 10.50         | 11.2         | 46            | 35.5         | AV       | L1   | FLO |
| 1.358000         | 10.00         | 11.5         | 46            | 36.0         | AV       | L1   | FLO |
| 17.242000        | 0.80          | 12.3         | 50            | 49.2         | AV       | L1   | FLO |



### Line Conducted Emission Test Line 2-N



#### MEASUREMENT RESULT: "TEST\_fin"

9/12/2019 12:21AM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.502000         | 22.40         | 11.2         | 56            | 33.6         | QP       | N    | FLO |
| 0.786000         | 18.50         | 10.7         | 56            | 37.5         | QP       | N    | FLO |
| 0.870000         | 16.30         | 11.0         | 56            | 39.7         | QP       | N    | FLO |
| 1.130000         | 16.10         | 11.5         | 56            | 39.9         | QP       | N    | FLO |
| 11.030000        | 14.80         | 12.0         | 60            | 45.2         | QP       | N    | FLO |
| 17.174000        | 13.80         | 12.3         | 60            | 46.2         | QP       | N    | FLO |

#### MEASUREMENT RESULT: "TEST\_fin2"

9/12/2019 12:21AM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.162000         | 13.10         | 10.8         | 55            | 42.3         | AV       | N    | FLO |
| 0.486000         | 11.20         | 11.1         | 46            | 35.0         | AV       | N    | FLO |
| 0.778000         | 12.90         | 10.7         | 46            | 33.1         | AV       | N    | FLO |
| 1.022000         | 10.00         | 11.4         | 46            | 36.0         | AV       | N    | FLO |
| 1.338000         | 10.80         | 11.5         | 46            | 35.2         | AV       | N    | FLO |
| 17.694000        | 4.50          | 12.3         | 50            | 45.5         | AV       | N    | FLO |

#### RESULT: PASS

Note: All the test modes had been tested, the mode 1 was the worst case. Only the data of the worst case would be record in this test report.

## APPENDIX A: PHOTOGRAPHS OF TEST SETUP

### RADIATED EMISSION TEST SETUP BELOW 1GHZ



RADIATED EMISSION TEST SETUP ABOVE 1GHZ



**CONDUCTED EMISSION TEST SETUP**

## APPENDIX B: PHOTOGRAPHS OF EUT

TOTAL VIEW OF EUT



TOP VIEW OF EUT



BOTTOM VIEW OF EUT



FRONT VIEW OF EUT



BACK VIEW OF EUT



LEFT VIEW OF EUT



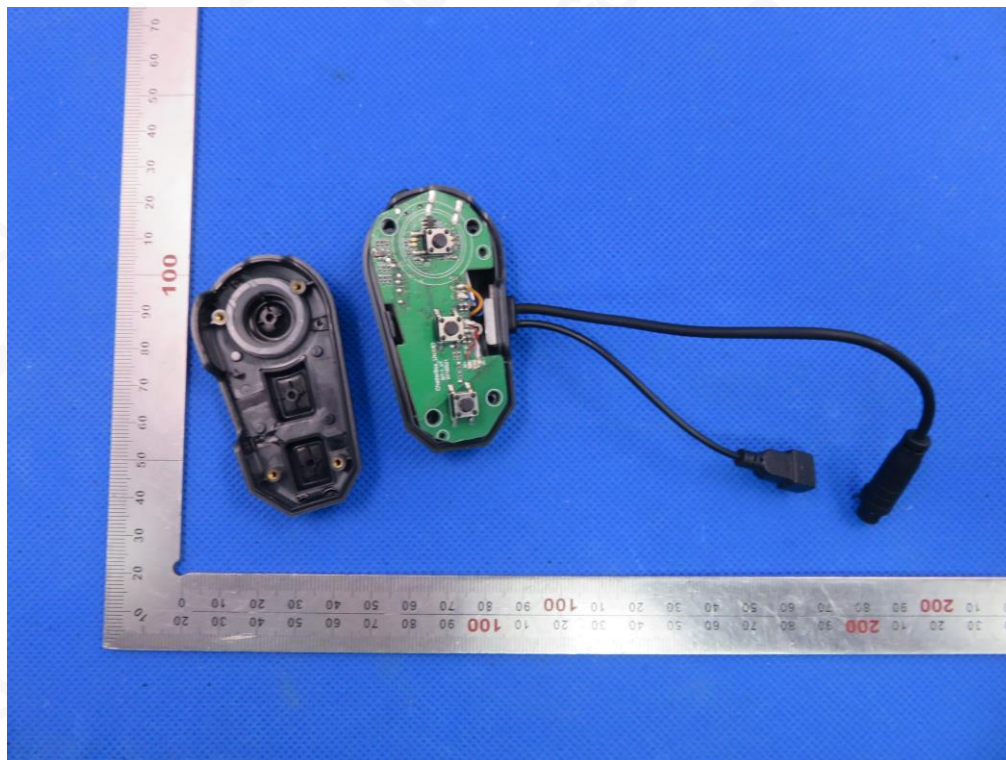
RIGHT VIEW OF EUT



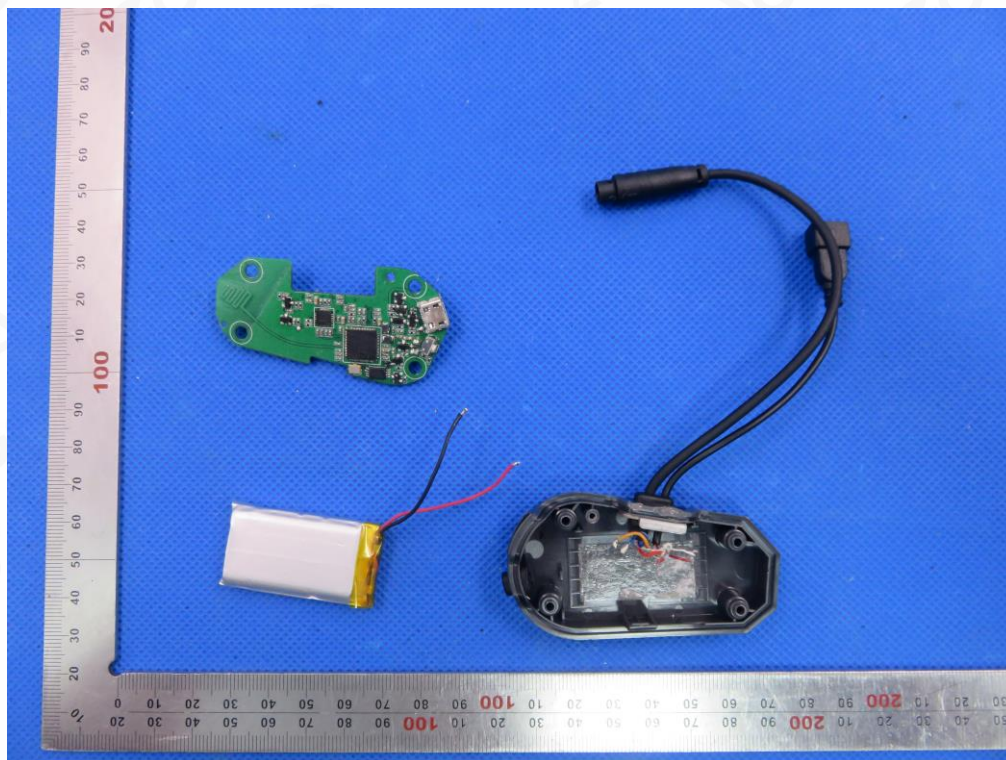
VIEW OF EUT (Port)



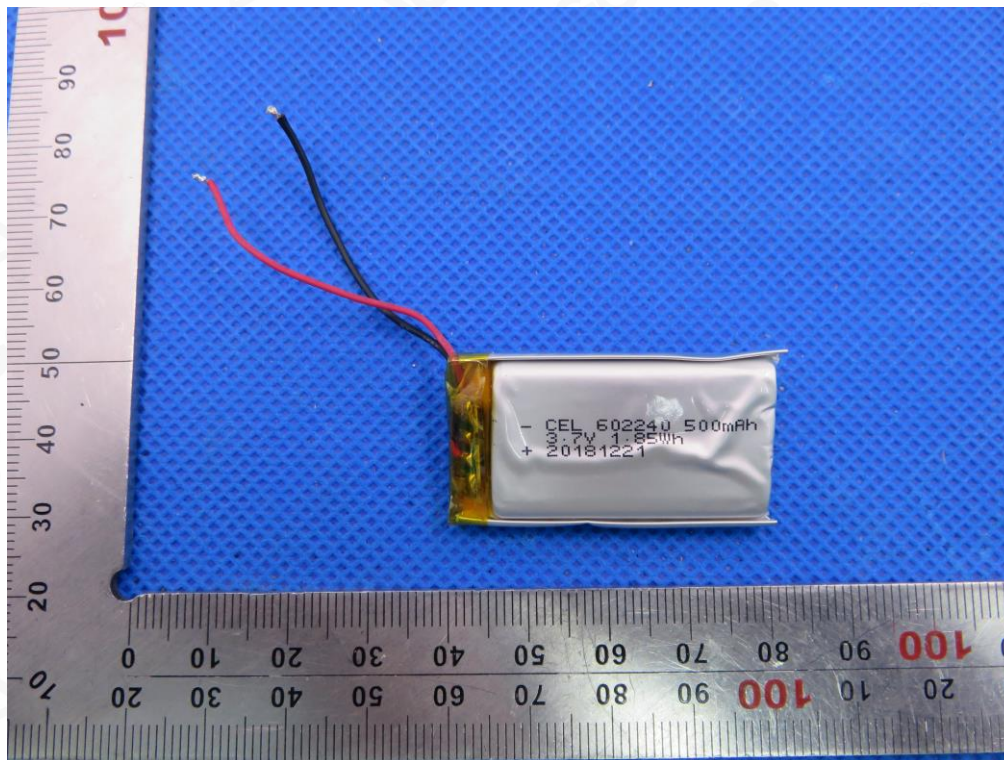
OPEN VIEW OF EUT-1



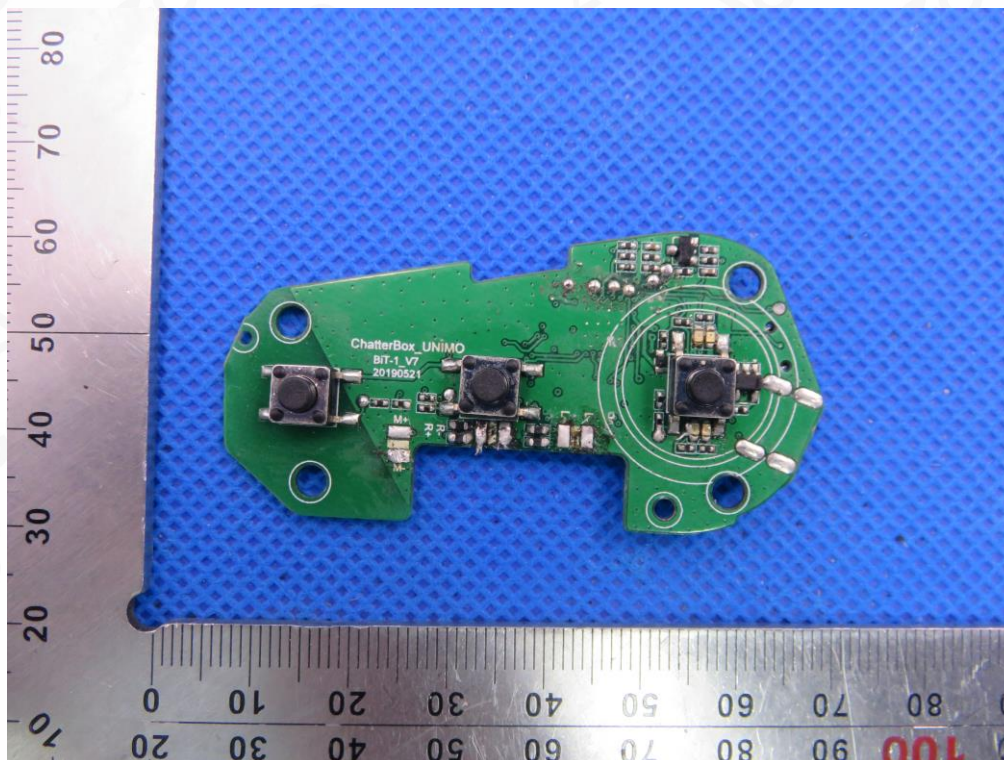
OPEN VIEW OF EUT-2



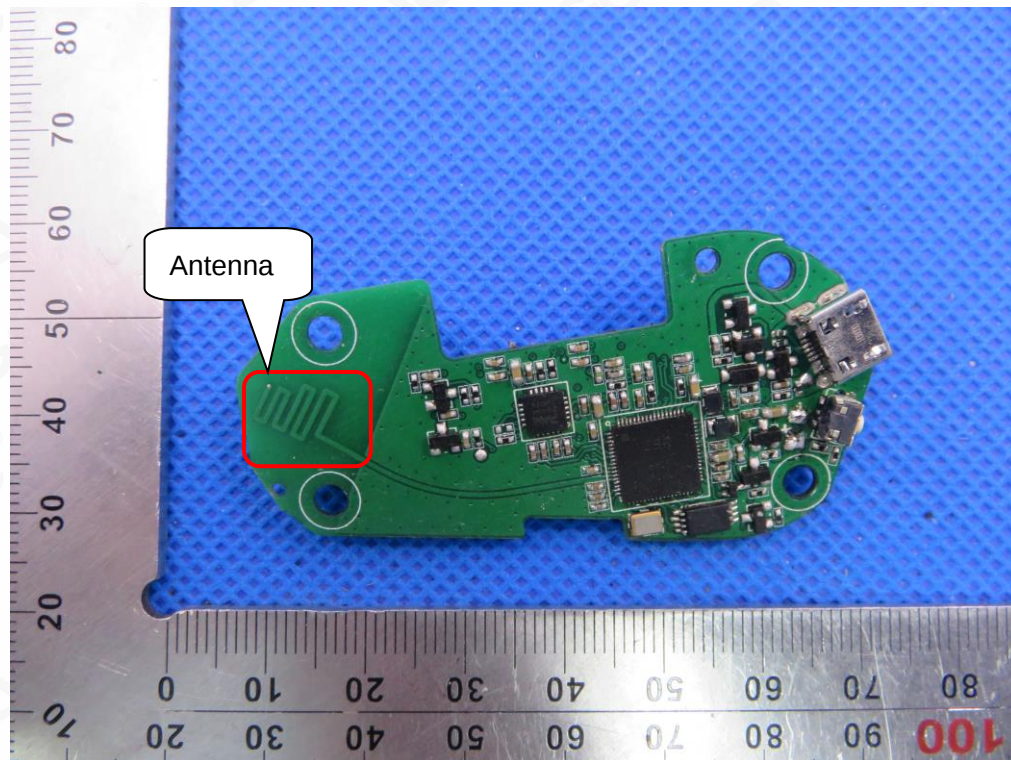
VIEW OF BATTERY



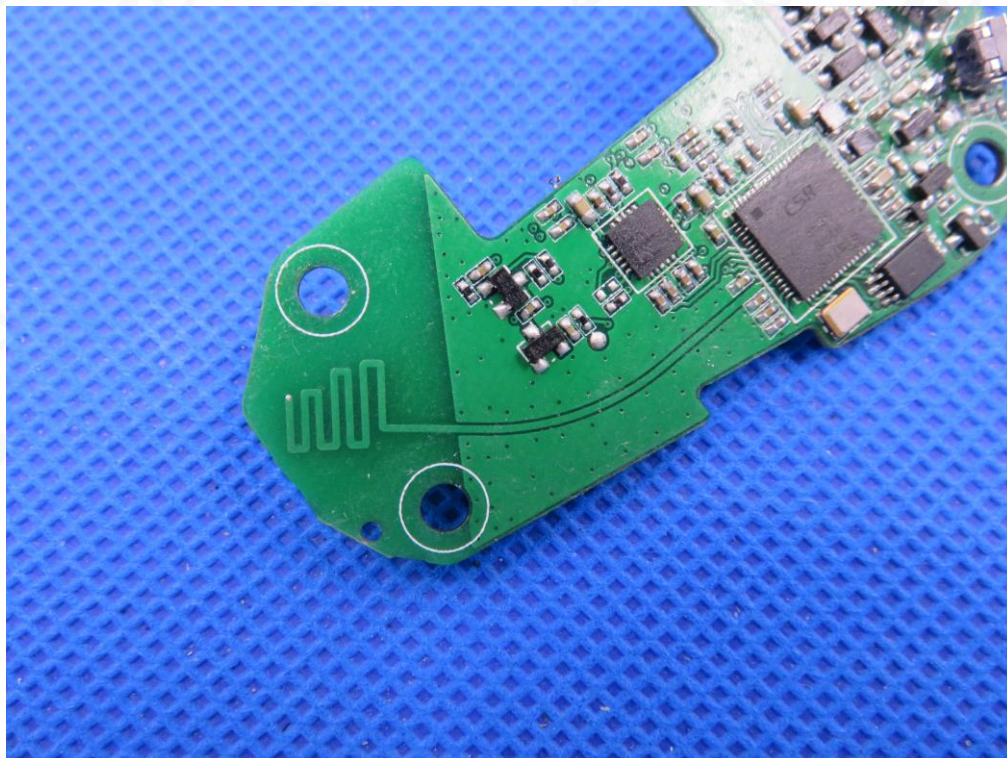
INTERNAL VIEW OF EUT-1



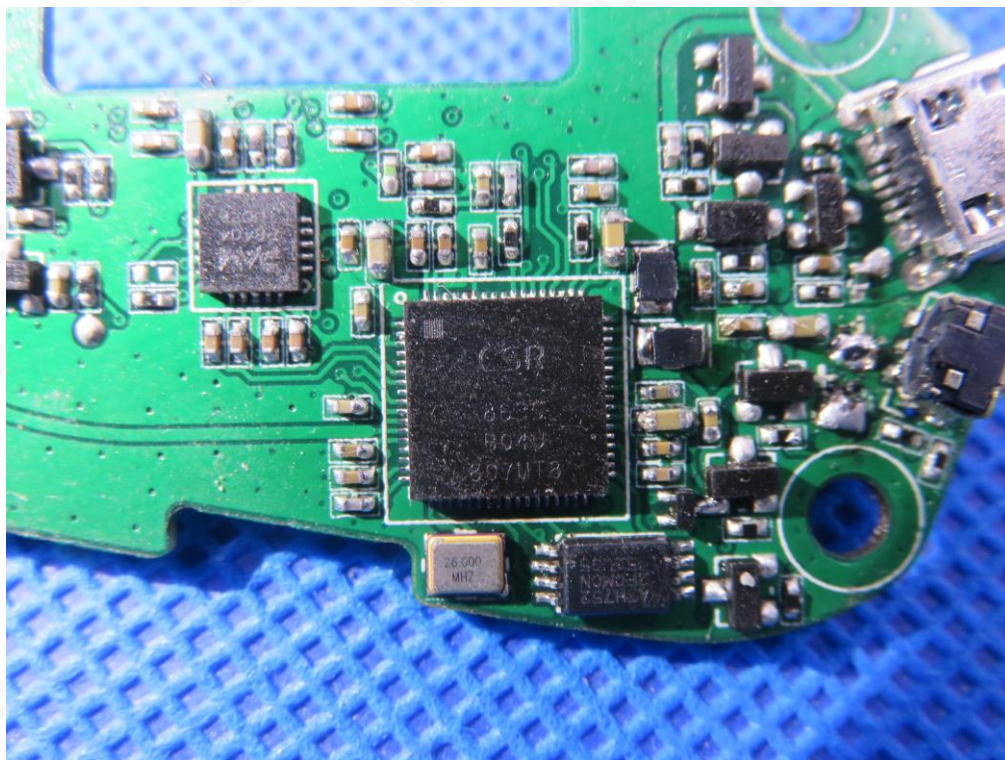
INTERNAL VIEW OF EUT-2



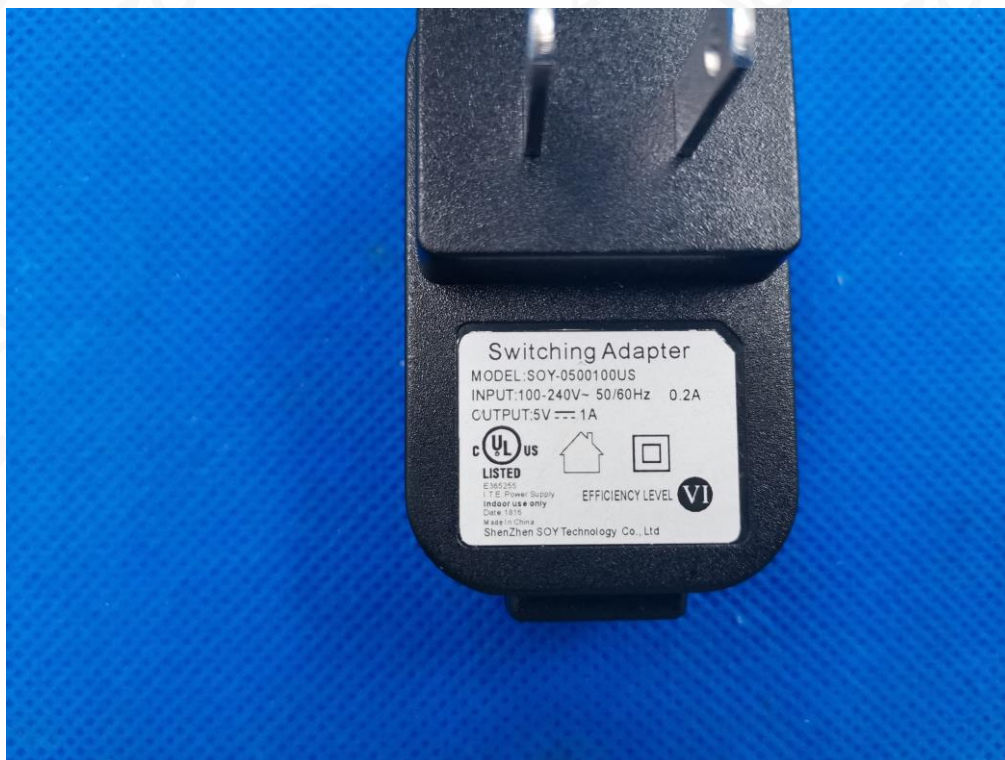
INTERNAL VIEW OF EUT-3



INTERNAL VIEW OF EUT-4



VIEW OF ADAPTER



----END OF REPORT----