| EUT | Bluetooth Earphone | Model Name | TWS30 |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | Mode 2 | Antenna | Horizontal |

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Value Type |
|---|---|---|---|---|---|---|
| 4882.022 | 44.81 | 0.14 | 44.95 | 74.00 | -29.05 | peak |
| 4882.022 | 41.26 | 0.14 | 41.40 | 54.00 | -12.60 | AVG |
| 7323.033 | 39.87 | 2.36 | 42.23 | 74.00 | -31.77 | peak |
| 7323.033 | 37.22 | 2.36 | 39.58 | 54.00 | -14.42 | AVG |
| | | | | | | |
| | | | | | | |
| Remark: | | | | | | |
| Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

| EUT | Bluetooth Earphone | Model Name | TWS30 |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | Mode 2 | Antenna | Vertical |

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Value Type |
|---|---|---|---|---|---|---|
| 4882.022 | 44.36 | 0.14 | 44.50 | 74.00 | -29.50 | peak |
| 4882.022 | 42.01 | 0.14 | 42.15 | 54.00 | -11.85 | AVG |
| 7323.033 | 41.74 | 2.36 | 44.10 | 74.00 | -29.90 | peak |
| 7323.033 | 38.96 | 2.36 | 41.32 | 54.00 | -12.68 | AVG |
| | | | | | | |
| | | | | | | |
| Remark: | | | | | | |
| Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

| EUT | Bluetooth Earphone | Model Name | TWS30 |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | Mode 3 | Antenna | Horizontal |

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Value Type |
|---|---|---|---|---|---|---|
| 4960.022 | 42.84 | 0.22 | 43.06 | 74.00 | -30.94 | peak |
| 4960.022 | 38.21 | 0.22 | 38.43 | 54.00 | -15.57 | AVG |
| 7440.033 | 41.71 | 2.64 | 44.35 | 74.00 | -29.65 | peak |
| 7440.033 | 36.36 | 2.64 | 39.00 | 54.00 | -15.00 | AVG |
| | | | | | | |
| | | | | | | |
| Remark: | | | | | | |
| Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

| EUT | Bluetooth Earphone | Model Name | TWS30 |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | Mode 3 | Antenna | Vertical |

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Value Type |
|---|---|---|---|---|---|---|
| 4960.022 | 44.24 | 0.22 | 44.46 | 74.00 | -29.54 | peak |
| 4960.022 | 39.93 | 0.22 | 40.15 | 54.00 | -13.85 | AVG |
| 7440.033 | 40.74 | 2.64 | 43.38 | 74.00 | -30.62 | peak |
| 7440.033 | 38.11 | 2.64 | 40.75 | 54.00 | -13.25 | 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.

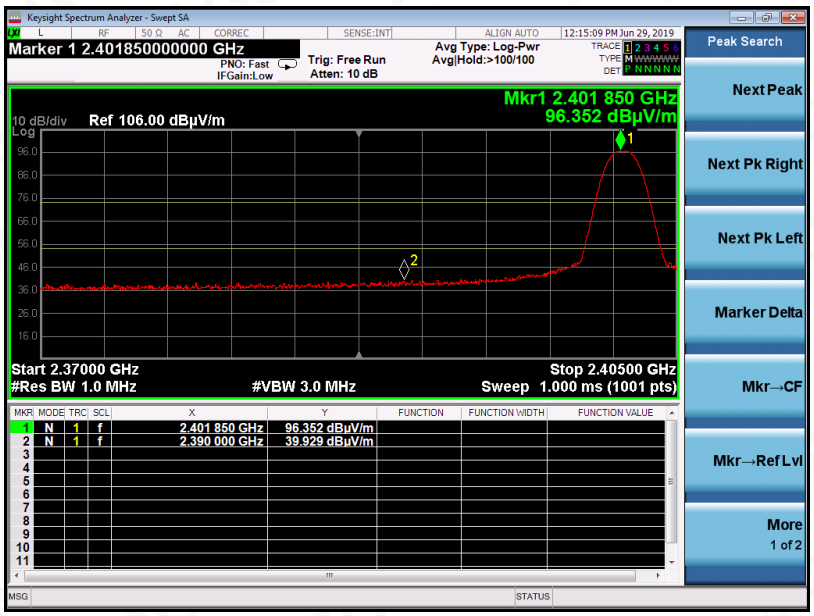
The “Factor” value can be calculated automatically by software of measurement system.

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

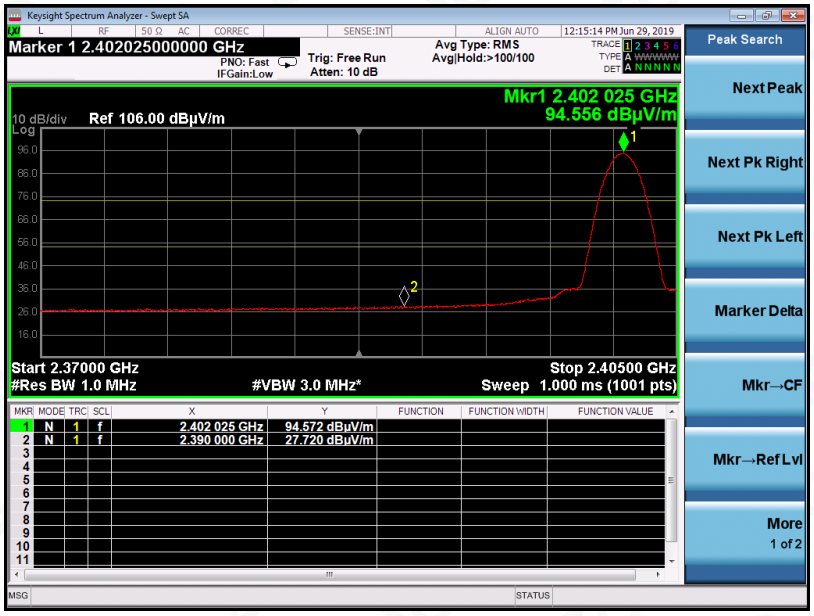
## TEST RESULT FOR RESTRICTED BANDS REQUIREMENTS

| EUT | Bluetooth Earphone | Model Name | TWS30 |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | Mode 1 | Antenna | Horizontal |

PK



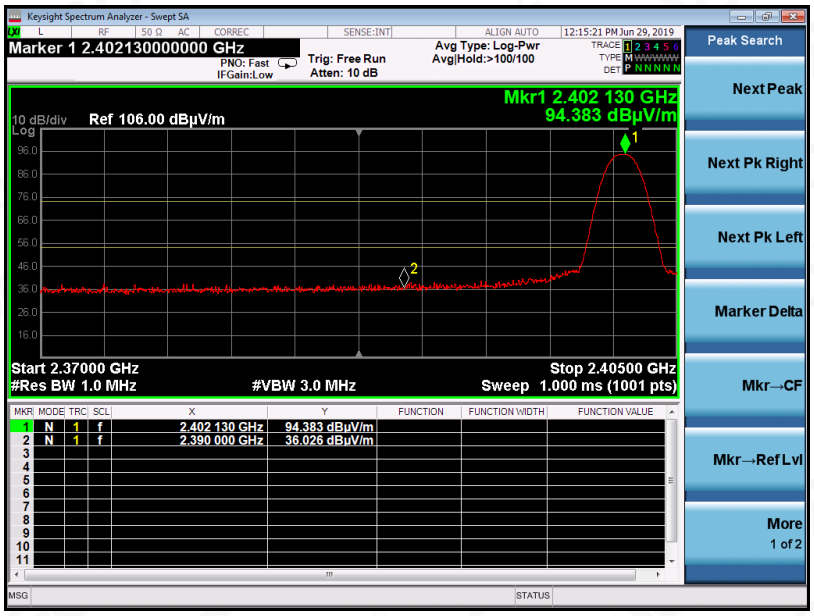

AV



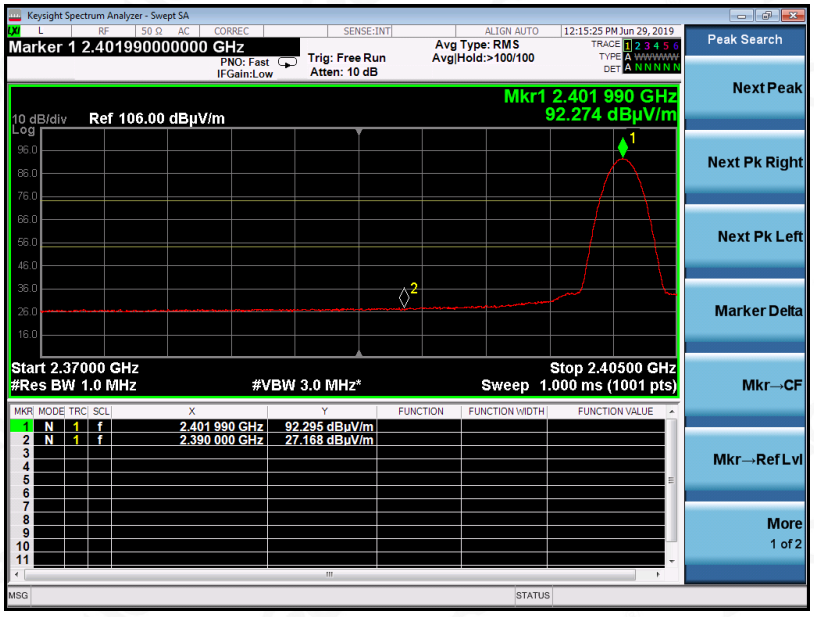

**RESULT: PASS**

| EUT | Bluetooth Earphone | Model Name | TWS30 |
|---|---|---|---|
| Temperature | 25℃ | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | Mode 1 | Antenna | Vertical |

PK




AV

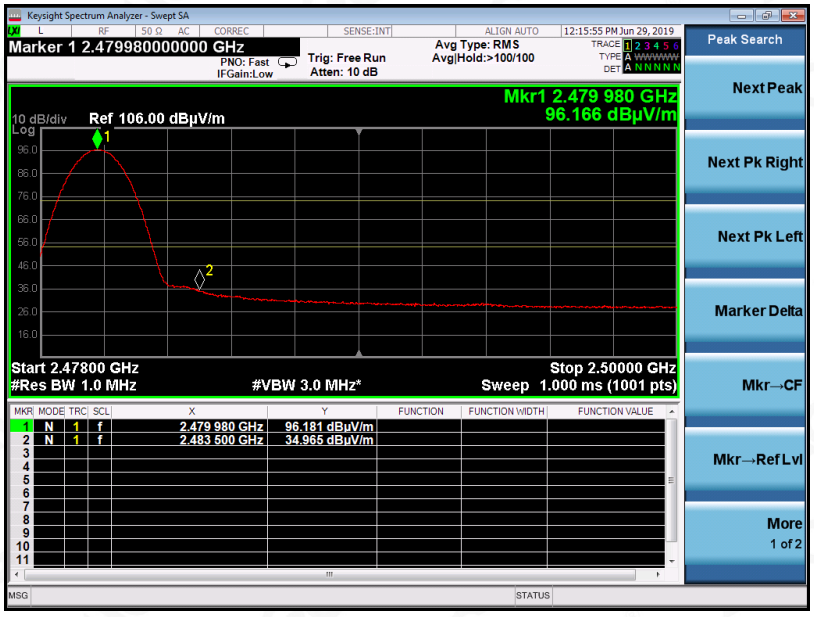



**RESULT: PASS**

| EUT | Bluetooth Earphone | Model Name | TWS30 |
|---|---|---|---|
| Temperature | 25℃ | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | Mode 3 | Antenna | Horizontal |

PK

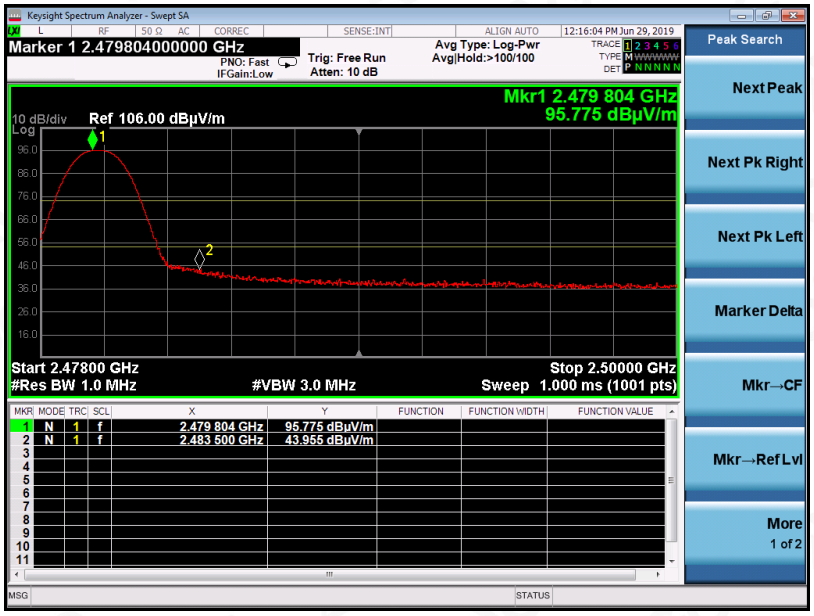

AV




**RESULT: PASS**

| EUT | Bluetooth Earphone | Model Name | TWS30 |
|---|---|---|---|
| Temperature | 25℃ | 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.

# 11. NUMBER OF HOPPING FREQUENCY

## 11.1. MEASUREMENT PROCEDURE

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:
1. Span: The frequency band of operation. Depending on the number of channels the device supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.
2. RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
3. VBW ⩾ RBW. Sweep: Auto. Detector function: Peak. Trace: Max hold.
4. Allow the trace to stabilize.

## 11.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 8.2

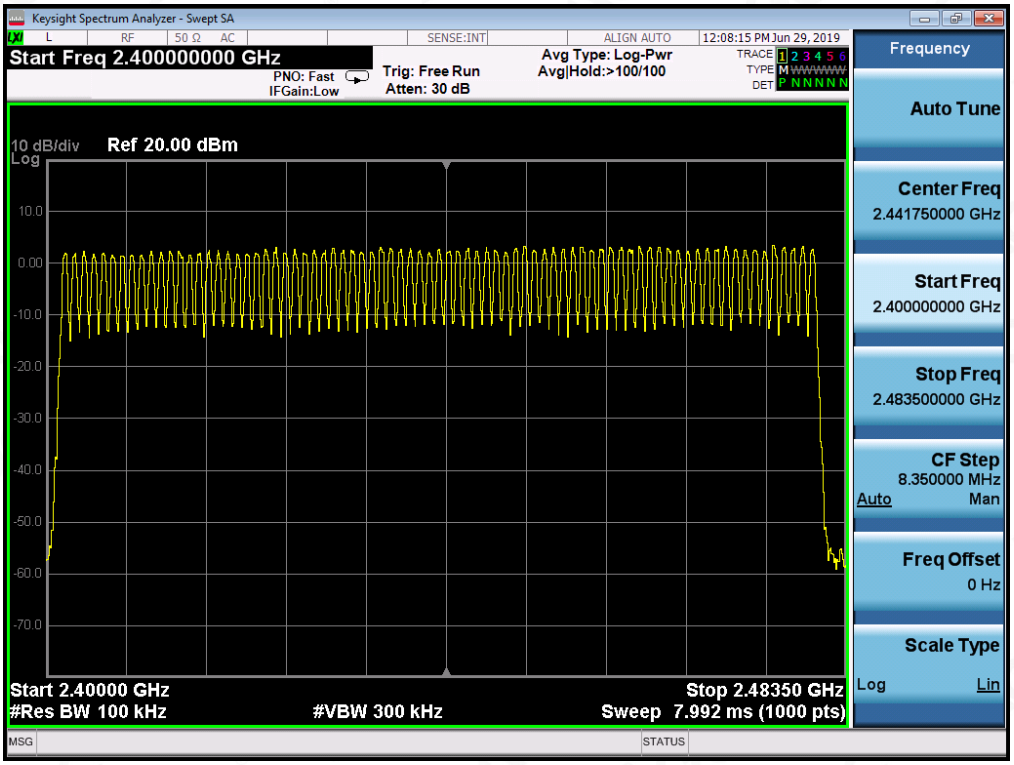
## 11.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6

## 11.4. LIMITS AND MEASUREMENT RESULT

| TOTAL NO. OF HOPPING CHANNEL | LIMIT (NO. OF CH) | MEASUREMENT (NO. OF CH) | RESULT |
|---|---|---|---|
| | >=15 | 79 | PASS |

TEST PLOT FOR NO. OF TOTAL CHANNELS




Note: The GFSK modulation is the worst case and recorded in the report.

# 12. TIME OF OCCUPANCY (DWELL TIME)

## 12.1. MEASUREMENT PROCEDURE

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:
1. Span: Zero span, centered on a hopping channel.
2. RBW shall be≤channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel.
3. Sweep: As necessary to capture the entire dwell time per hopping channel; where possible use a video trigger and trigger delay so that the transmitted signal starts a little to the right of the start of the plot. The trigger level might need slight adjustment to prevent triggering when the system hops on an adjacent channel; a second plot might be needed with a longer sweep time to show two successive hops on a channel.
4. Detector function: Peak. Trace: Max hold.
5. Use the marker-delta function to determine the transmit time per hop.
6. Repeat the measurement using a longer sweep time to determine the number of hops over the period specified in the requirements. The sweep time shall be equal to, or less than, the period specified in the requirements. Determine the number of hops over the sweep time and calculate the total number of hops in the period specified in the requirements, using the following equation:
(Number of hops in the period specified in the requirements) = (number of hops on spectrum analyzer) × (period specified in the requirements / analyzer sweep time)
7. The average time of occupancy is calculated from the transmit time per hop multiplied by the number of hops in the period specified in the requirements.

## 12.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 8.2

## 12.3. MEASUREMENT EQUIPMENT USED

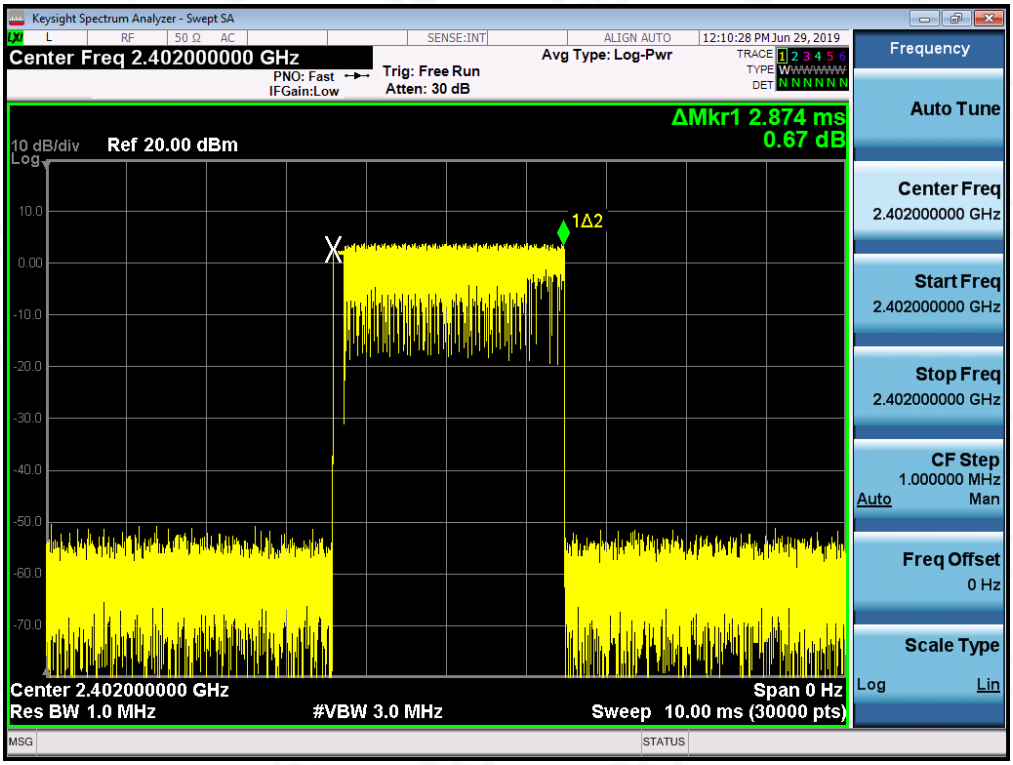
The same as described in section 6

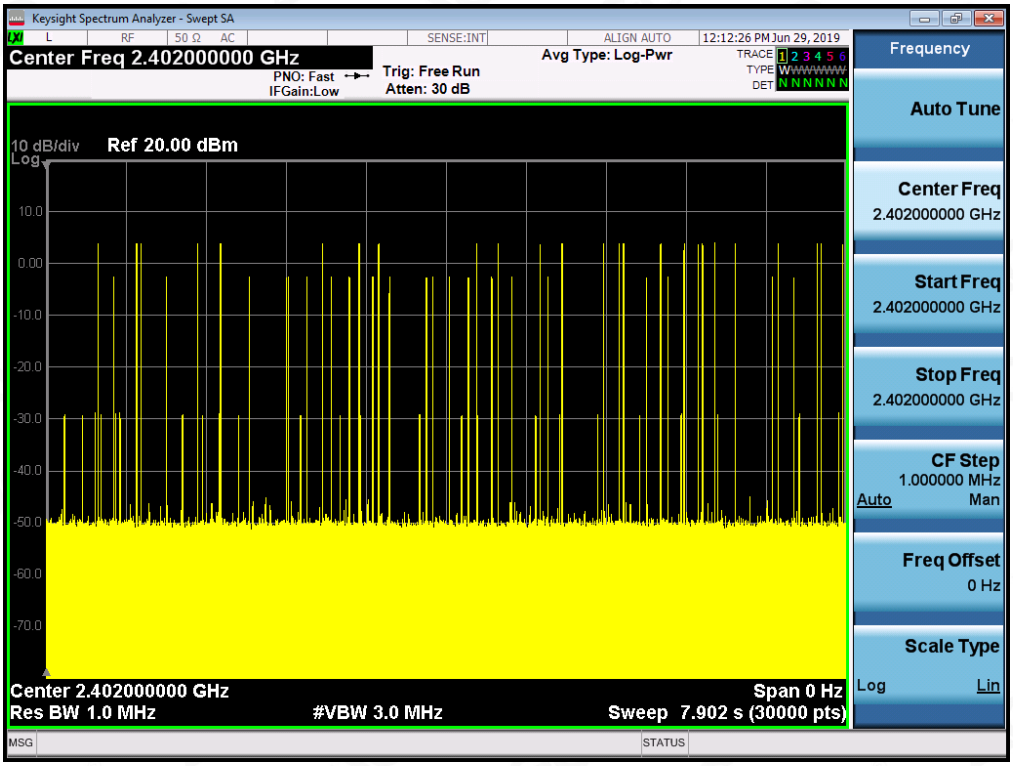
## 12.4. LIMITS AND MEASUREMENT RESULT

| Channel | Time of Pulse for DH5 (ms) | Number of hops in the period specified in the requirements | Sweep Time (ms) | Limit (ms) |
|---|---|---|---|---|
| Low | 2.874 | 25*4 | 287.400 | 400 |
| Middle | 2.887 | 27*4 | 311.796 | 400 |
| High | 2.886 | 28*4 | 323.232 | 400 |

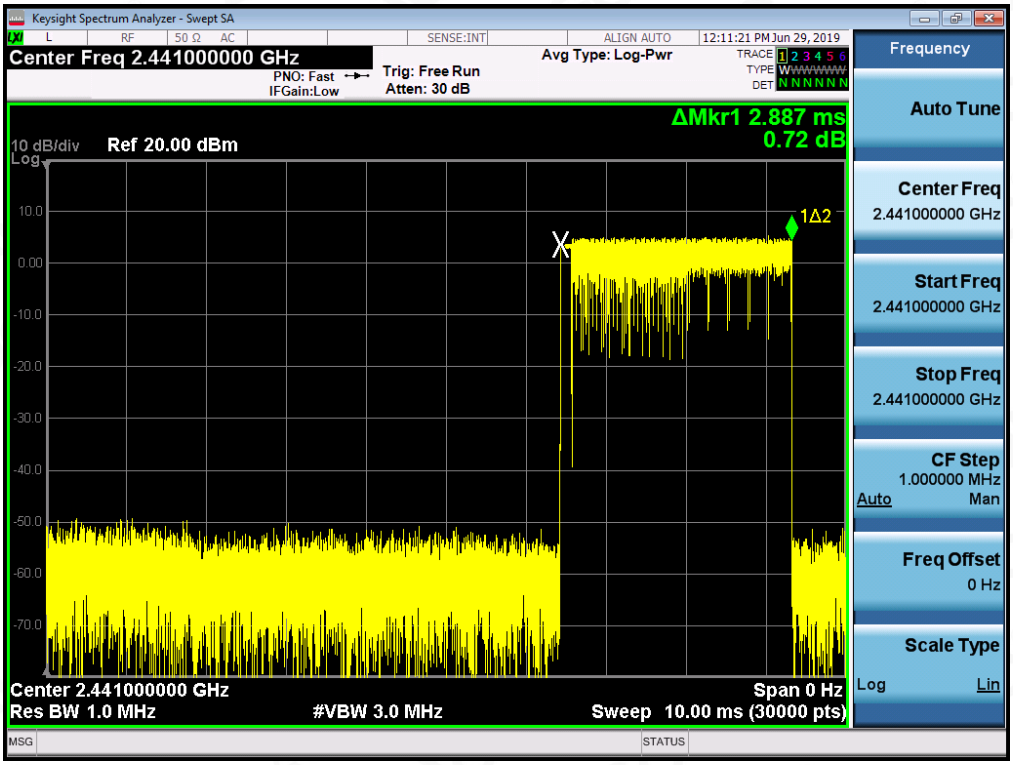
Note: The 8-DPSK modulation is the worst case and recorded in the report.

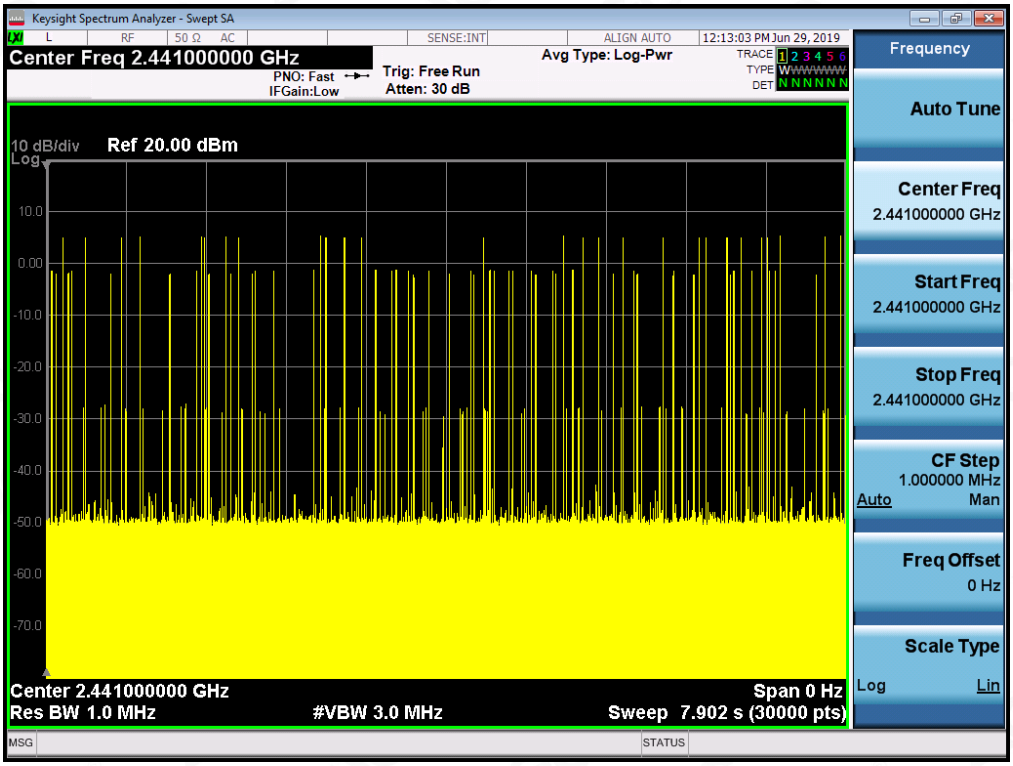
TEST PLOT OF LOW CHANNEL



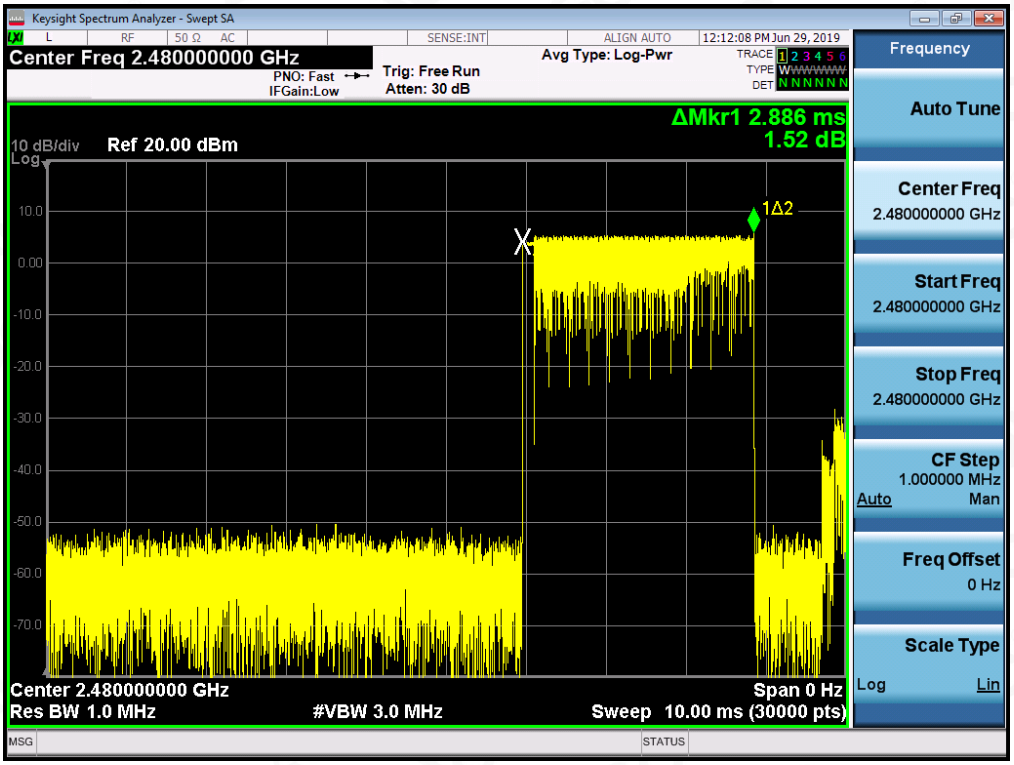



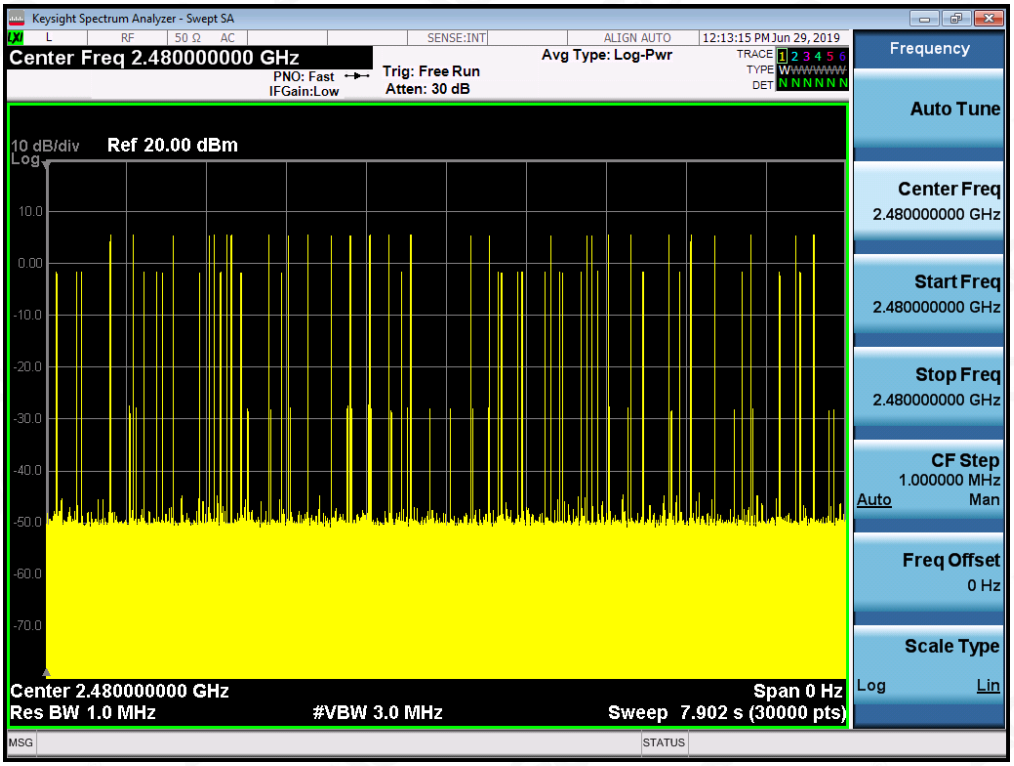
TEST PLOT OF MIDDLE CHANNEL



TEST PLOT OF HIGH CHANNEL



# 13. FREQUENCY SEPARATION

## 13.1. MEASUREMENT PROCEDURE

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:
1. Span: Wide enough to capture the peaks of two adjacent channels.
2. RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.
3. Video (or average) bandwidth (VBW) ≥ RBW.
4. Sweep: Auto. e) Detector function: Peak. f) Trace: Max hold. g) Allow the trace to stabilize.
Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

## 13.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 6.2

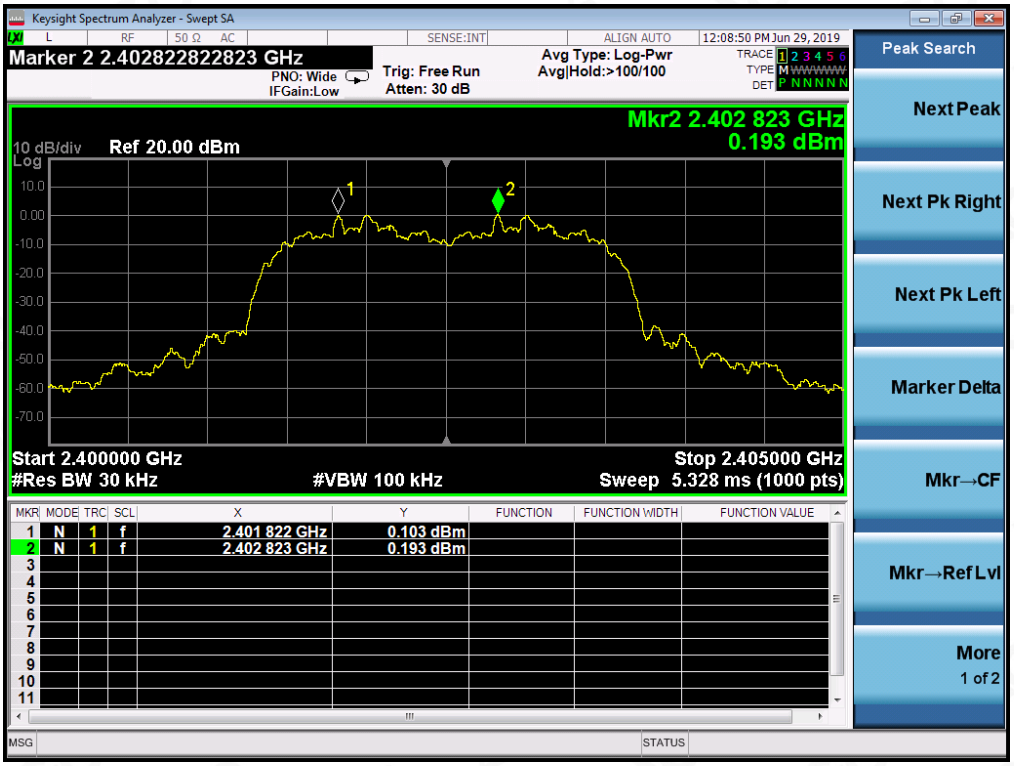
## 13.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6.3

## 13.4. LIMITS AND MEASUREMENT RESULT

| CHANNEL | CHANNEL SEPARATION | LIMIT | RESULT |
|---|---|---|---|
| | KHz | KHz | Pass |
| CH01-CH02 | 1001 | >=25 KHz or 2/3 20 dB BW | |

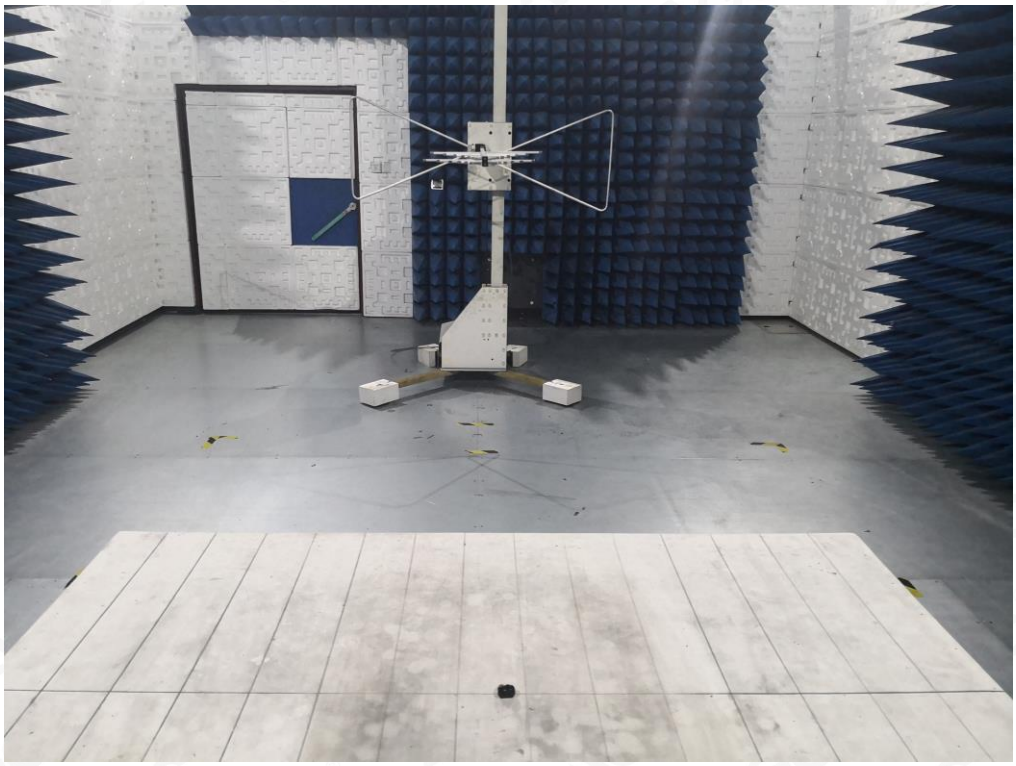
TEST PLOT FOR FREQUENCY SEPARATION




Note: The 8-DPSK modulation is the worst case and recorded in the report.

# APPENDIX A: PHOTOGRAPHS OF TEST SETUP

RADIATED EMISSION TEST SETUP BELOW 1GHZ



RADIATED EMISSION TEST SETUP ABOVE 1GHZ

# APPENDIX B: PHOTOGRAPHS OF EUT

ALL VIEW OF EUT

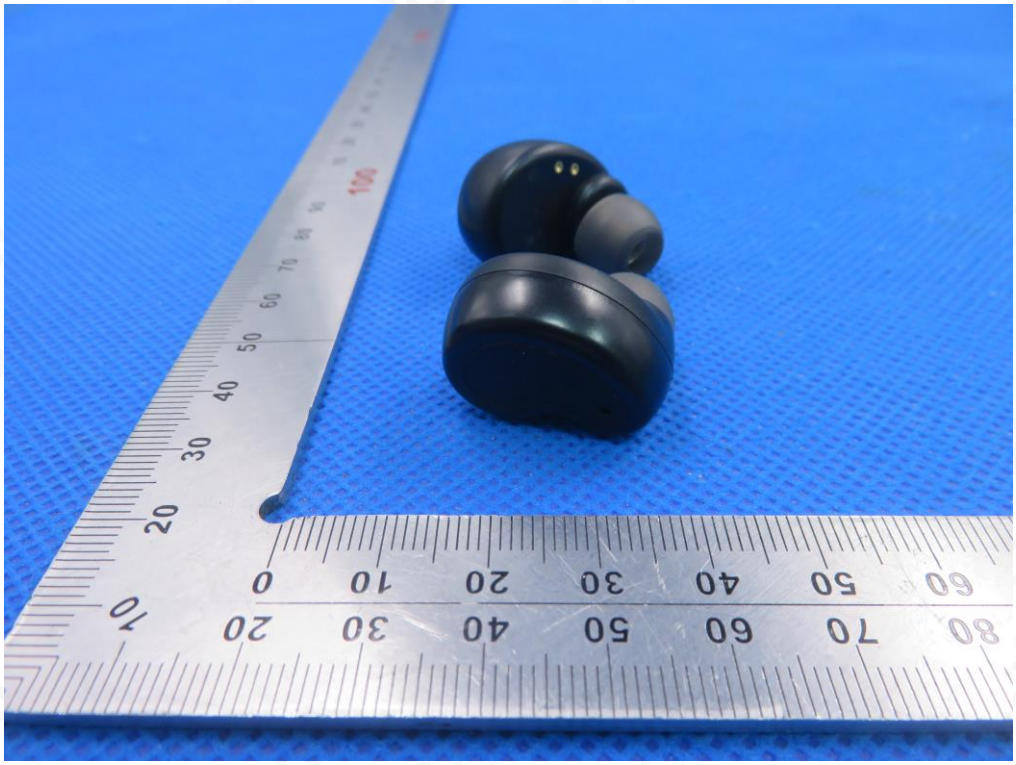
TOP VIEW OF EUT

BOTTOM VIEW OF EUT

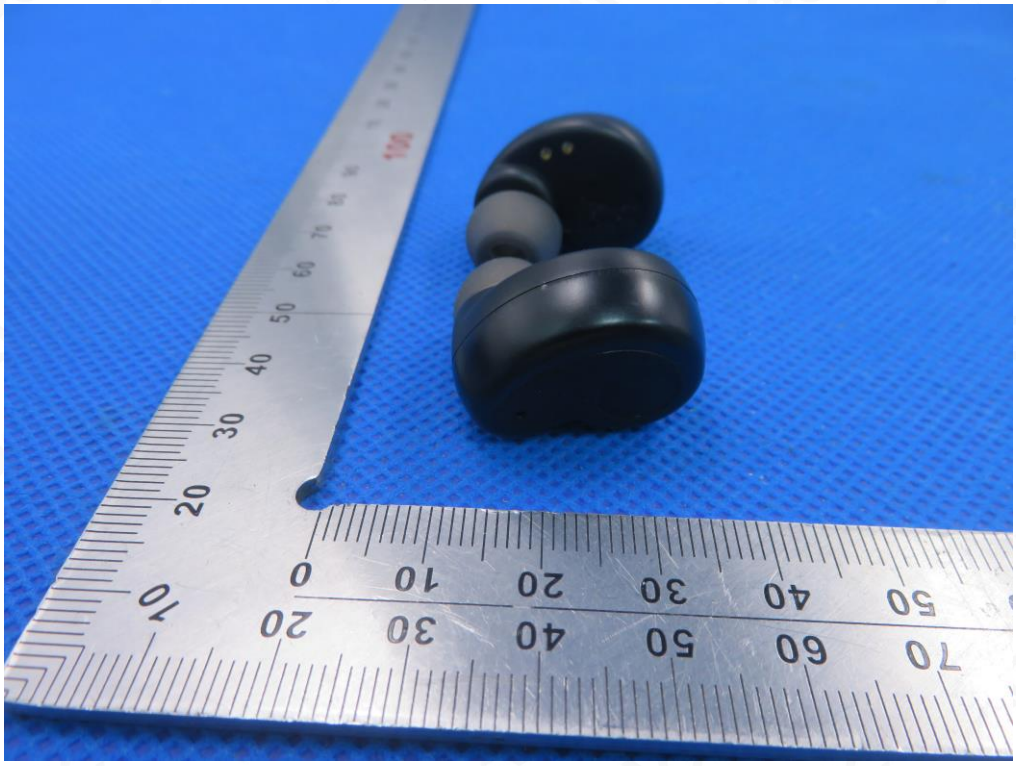
FRONT VIEW OF EUT

BACK VIEW OF EUT

LEFT VIEW OF EUT

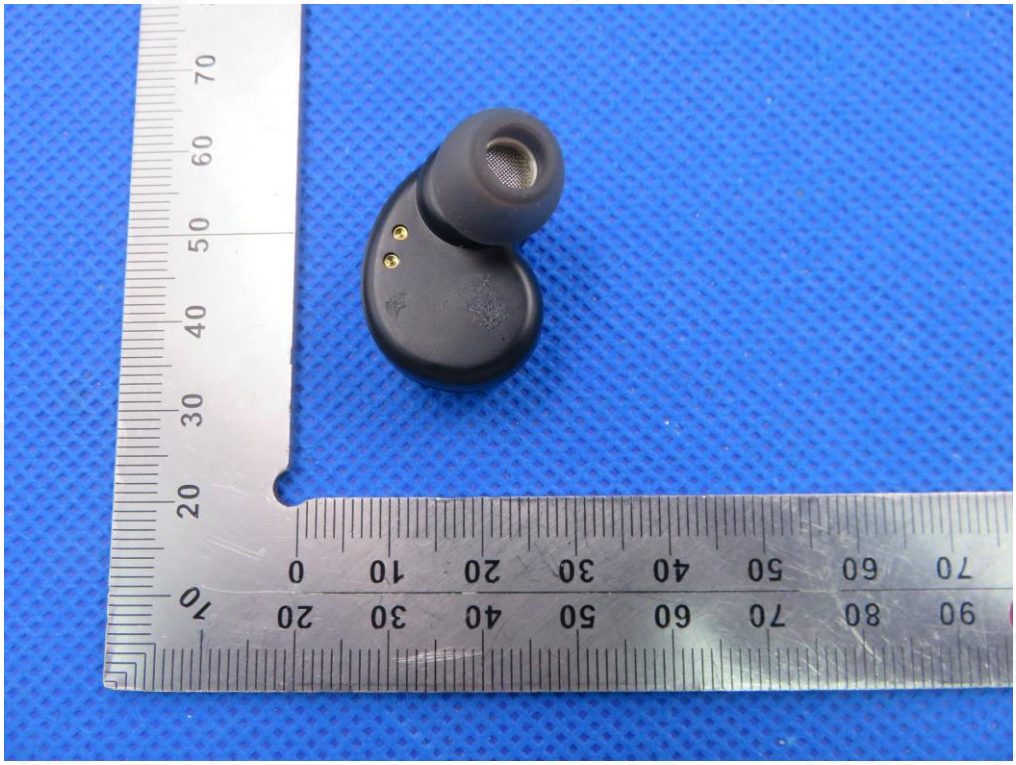


RIGHT VIEW OF EUT

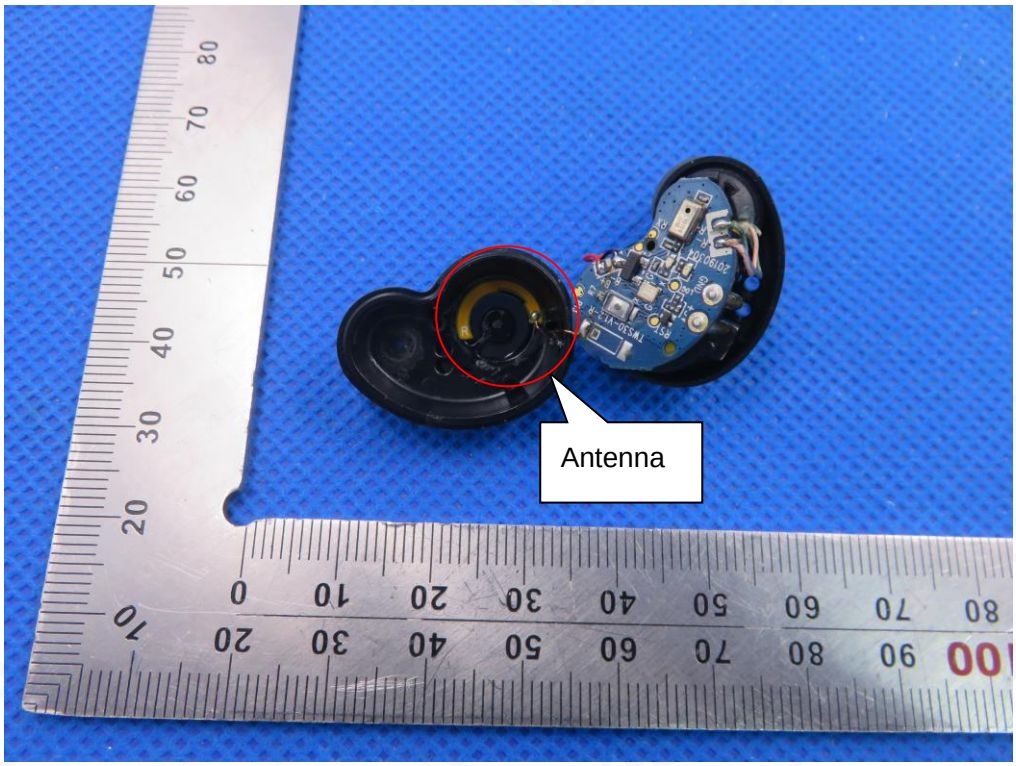


VIEW OF EUT(PORT)

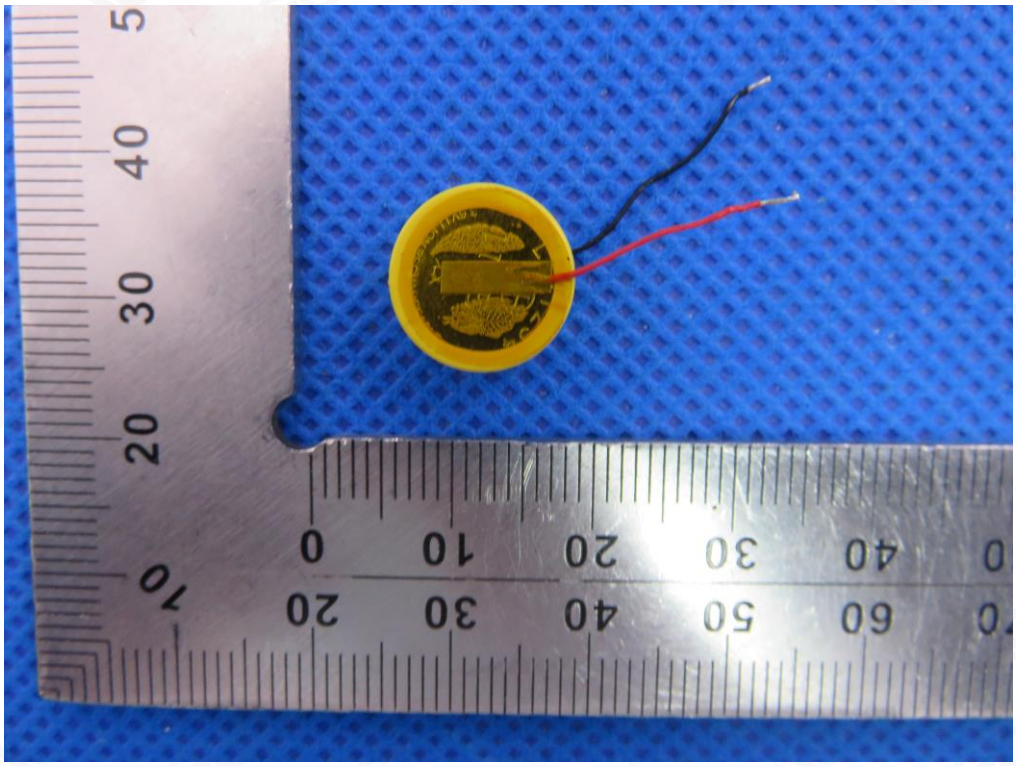
OPEN VIEW-1 OF EUT (Right)



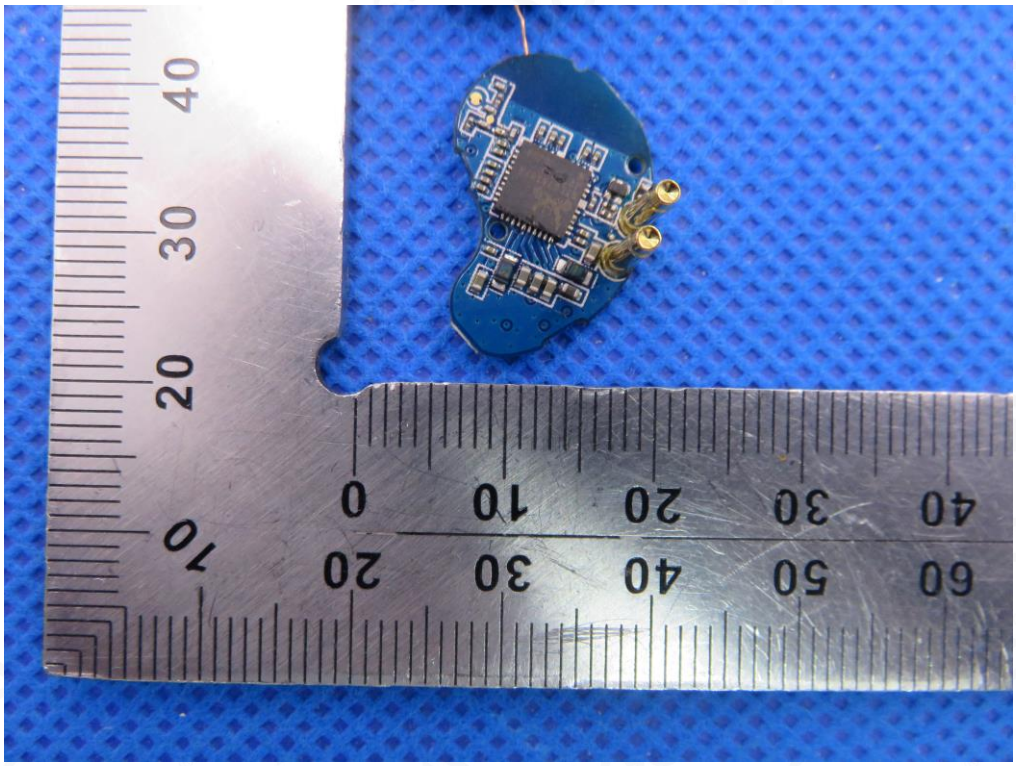
OPEN VIEW-2 OF EUT



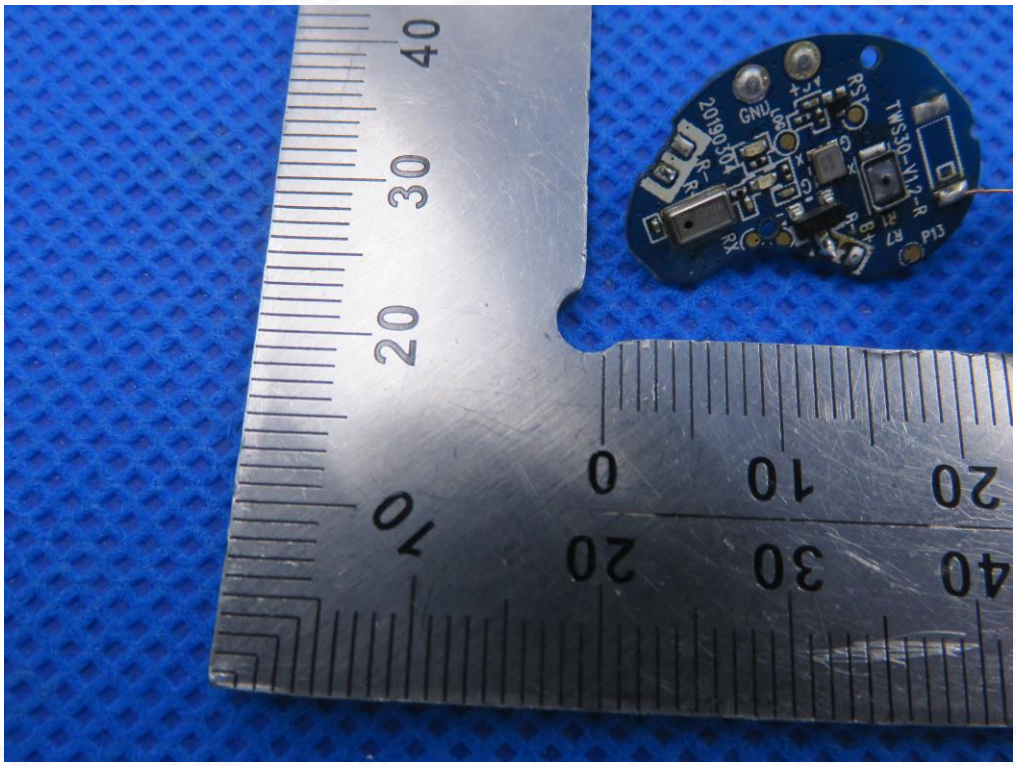

VIEW OF BATTERY



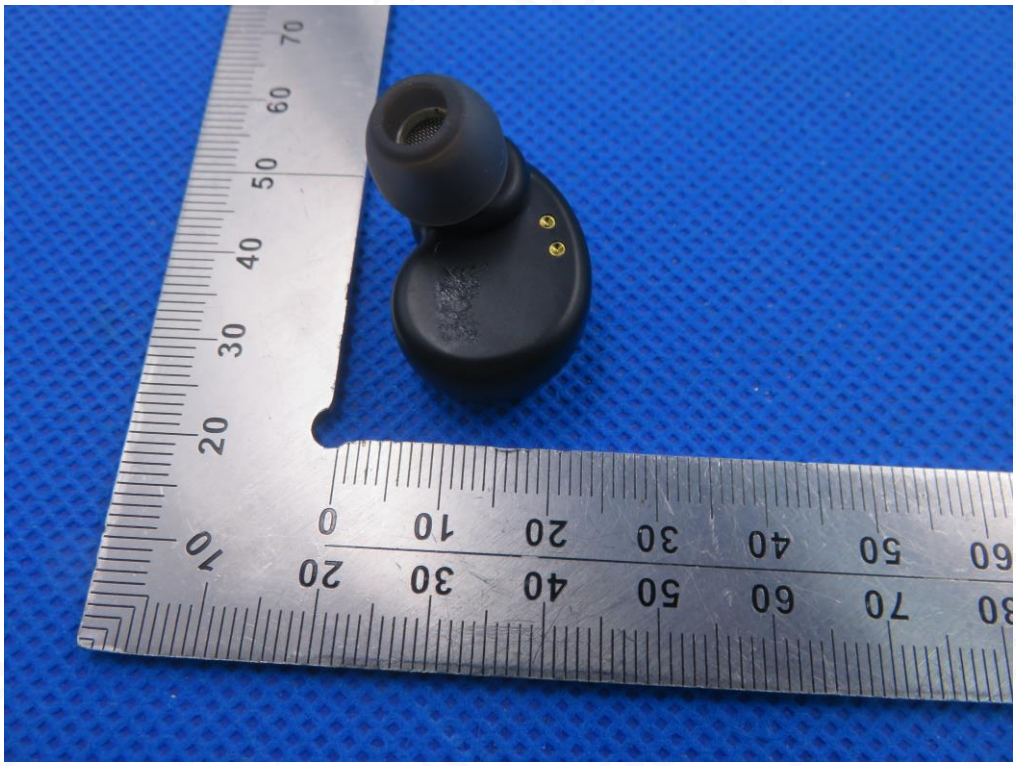
INTERNAL VIEW-1 OF EUT



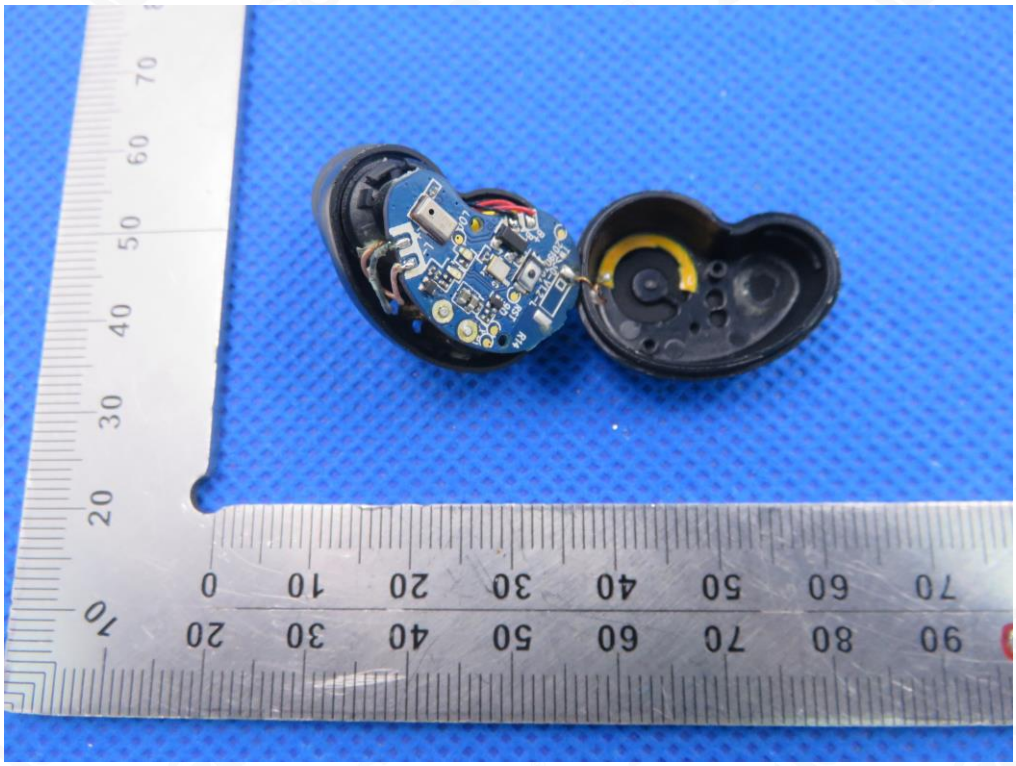
INTERNAL VIEW-2 OF EUT



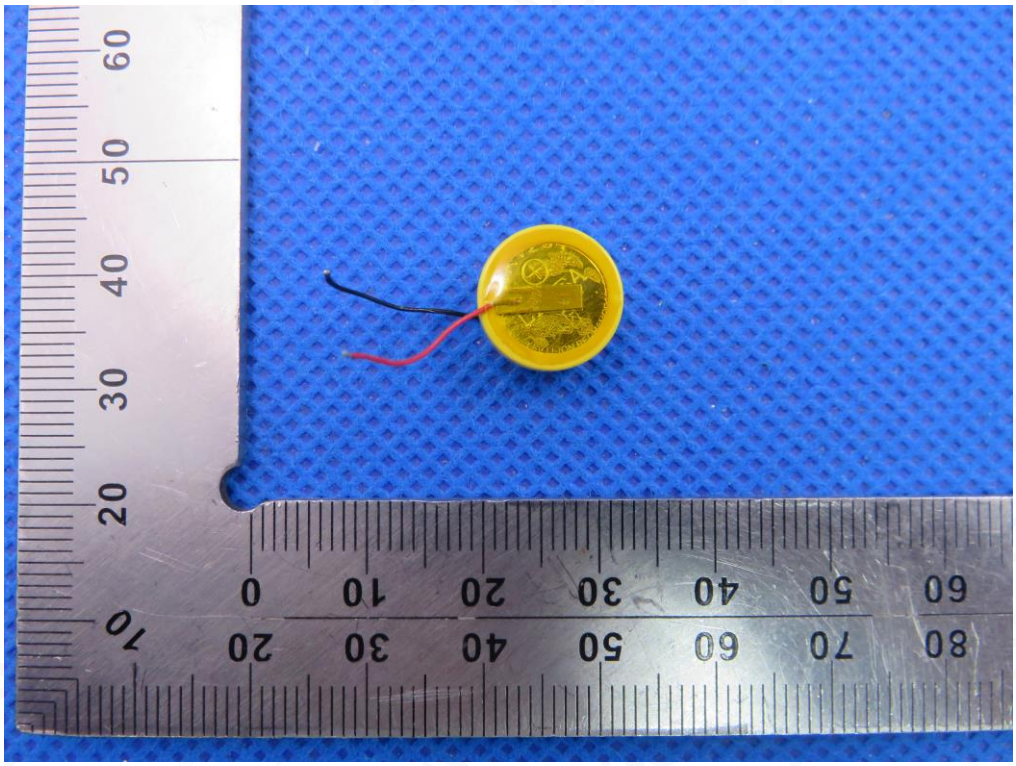
OPEN VIEW-1 OF EUT(Left)



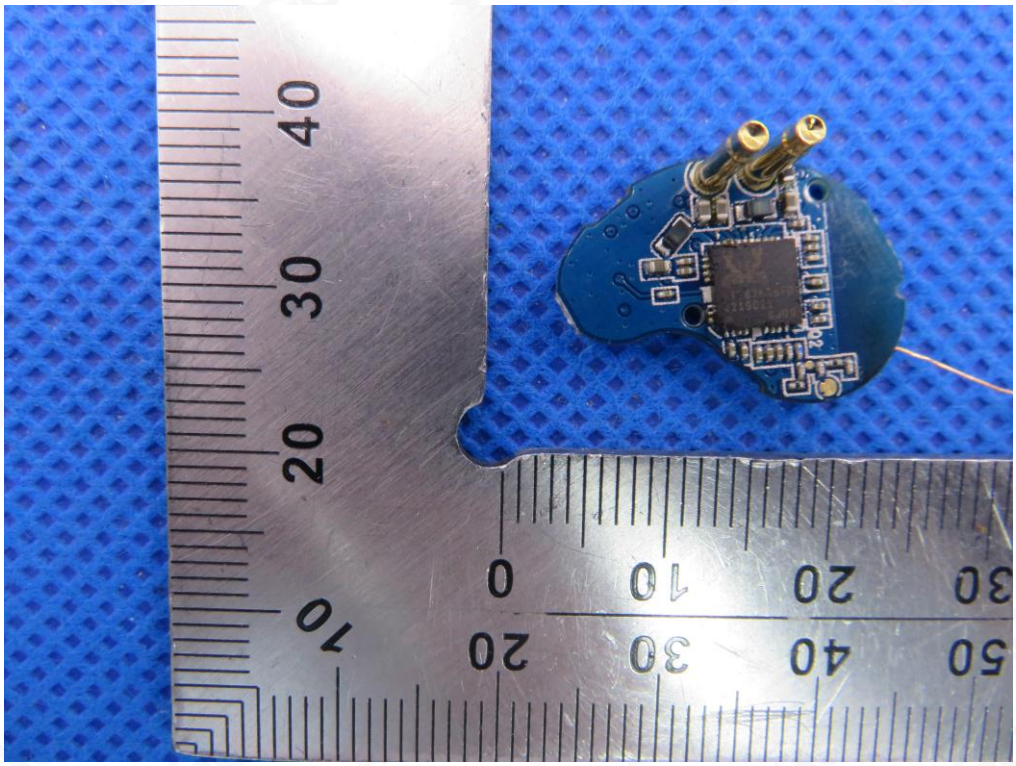
OPEN VIEW-2 OF EUT



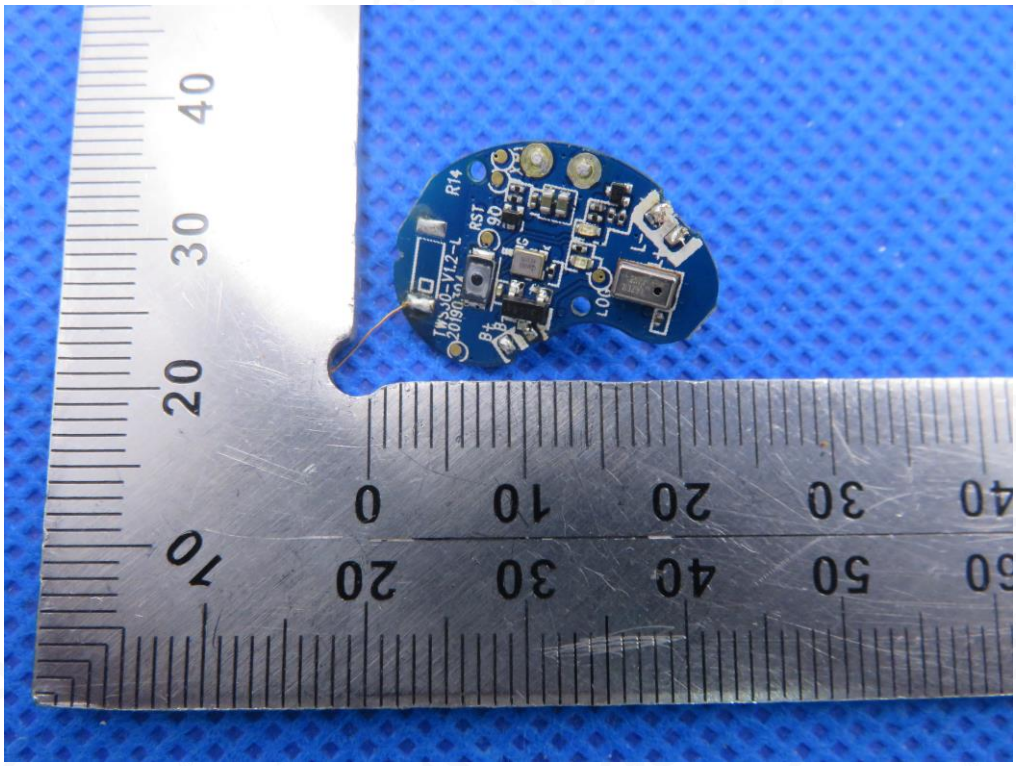
VIEW OF BATTERY



INTERNAL VIEW-1 OF EUT



INTERNAL VIEW-2 OF EUT




**----END OF REPORT----**