



### 8 6dB Bandwidth Measurement

Test Requirement : FCC CFR47 Part 15 Section 15.247

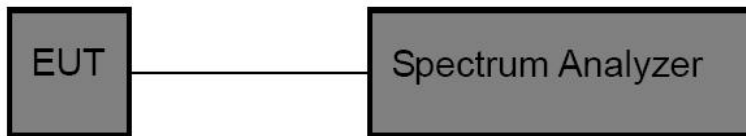
Test Method : ANSI C63.10:2013

Test Limit Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

#### Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

#### Test Setup



#### Test Result

| Test Mode | Antenna | Frequency[MHz] | DTS BW [MHz] | FL[MHz]  | FH[MHz]  | Limit[MHz] | Verdict |
|-----------|---------|----------------|--------------|----------|----------|------------|---------|
| BLE_1M    | Ant1    | 2402           | 0.648        | 2401.668 | 2402.316 | 0.5        | PASS    |
| BLE_1M    | Ant1    | 2440           | 0.688        | 2439.644 | 2440.332 | 0.5        | PASS    |
| BLE_1M    | Ant1    | 2480           | 0.692        | 2479.640 | 2480.332 | 0.5        | PASS    |



Test Graphs:



BLE\_1M-Ant1-2402-PASS



BLE\_1M-Ant1-2440-PASS



BLE\_1M-Ant1-2480-PASS



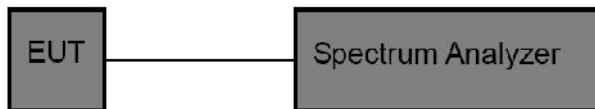
## 9 Maximum Peak Output Power

- Test Requirement : FCC CFR47 Part 15 Section 15.247
- Test Method : ANSI C63.10:2013
- Test Limit : Regulation 15.247 (b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power.

### 9.1 Test Procedure

1. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. Measure the conducted output power and record the results in the test report.

### 9.2 Test Setup

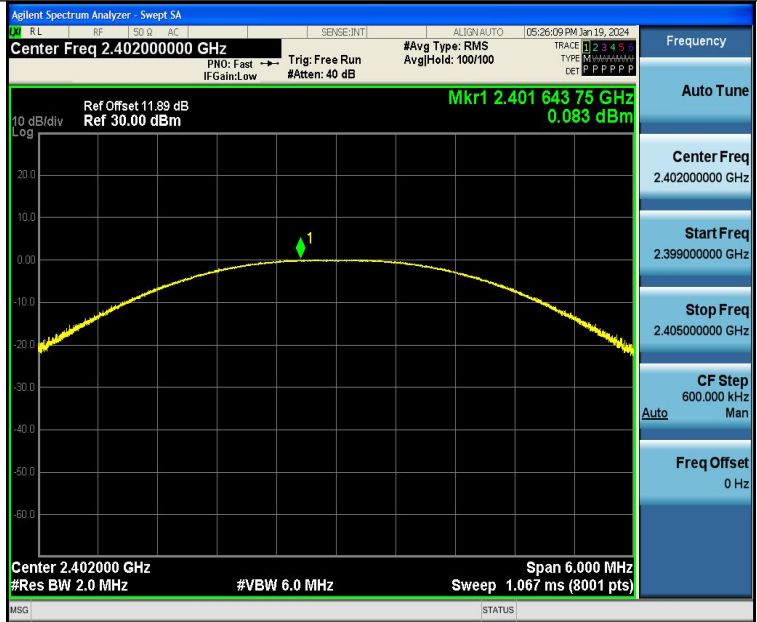


### 9.3 Test Result

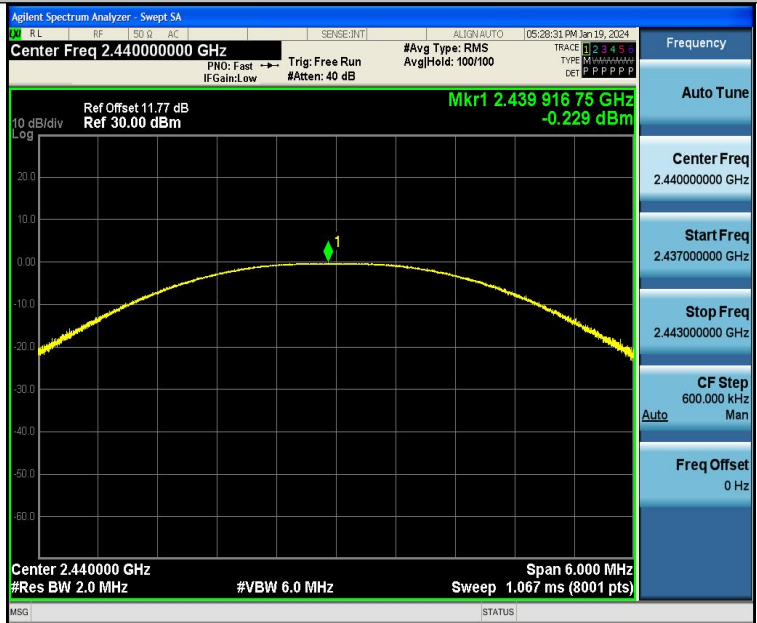
| Test Mode | Antenna | Frequency[MHz] | Conducted Peak Power[dBm] | Conducted Limit[dBm] | Verdict |
|-----------|---------|----------------|---------------------------|----------------------|---------|
| BLE_1M    | Ant1    | 2402           | 0.08                      | ≤30                  | PASS    |
| BLE_1M    | Ant1    | 2440           | -0.23                     | ≤30                  | PASS    |
| BLE_1M    | Ant1    | 2480           | -0.44                     | ≤30                  | PASS    |



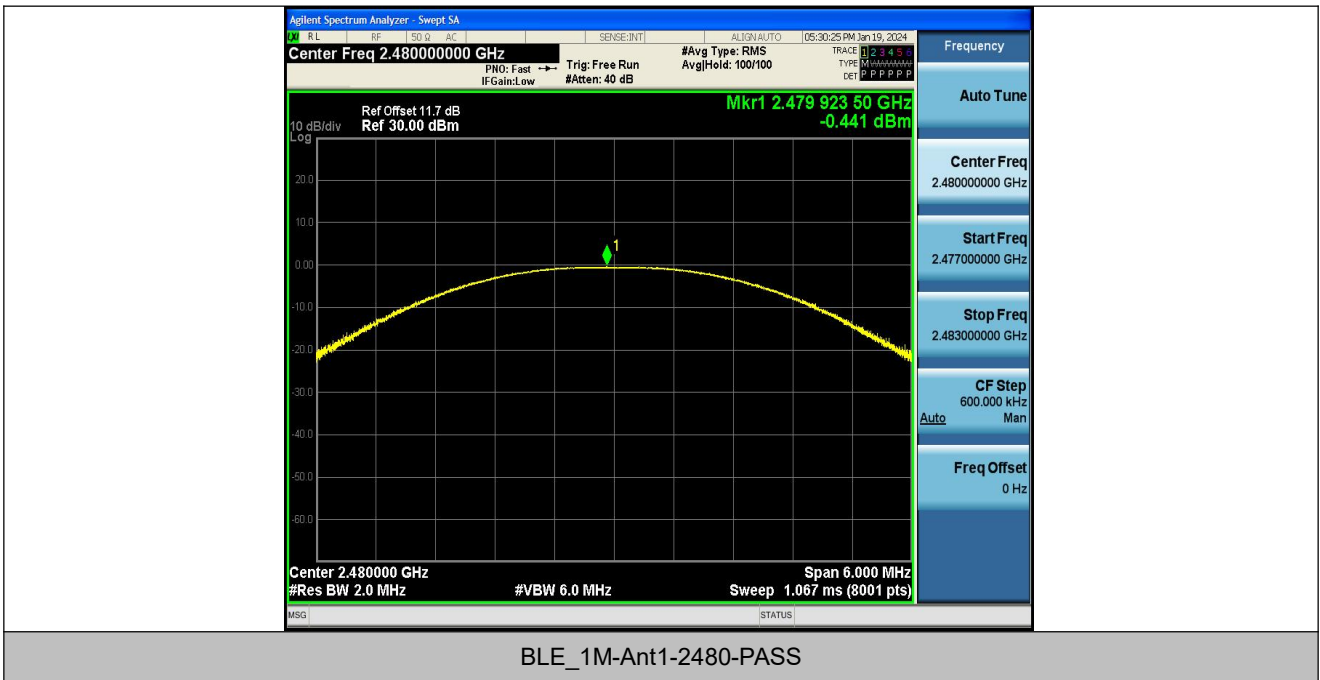
Test Graphs:



BLE\_1M-Ant1-2402-PASS



BLE\_1M-Ant1-2440-PASS





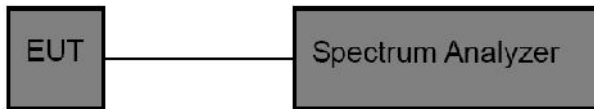
## 10 Power Spectral density

- Test Requirement : FCC CFR47 Part 15 Section 15.247
- Test Method : ANSI C63.10:2013
- Test Limit : Regulation 15.247(f) The power spectral density conducted from the intentional radiator to the antenna due to the digital modulation operation of the hybrid system, with the frequency hopping operation turned off, shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

### 10.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 3kHz. VBW = 10kHz , Span = 1.5 times the DTS channel bandwidth(6 dB bandwidth). Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

### 10.2 Test Setup

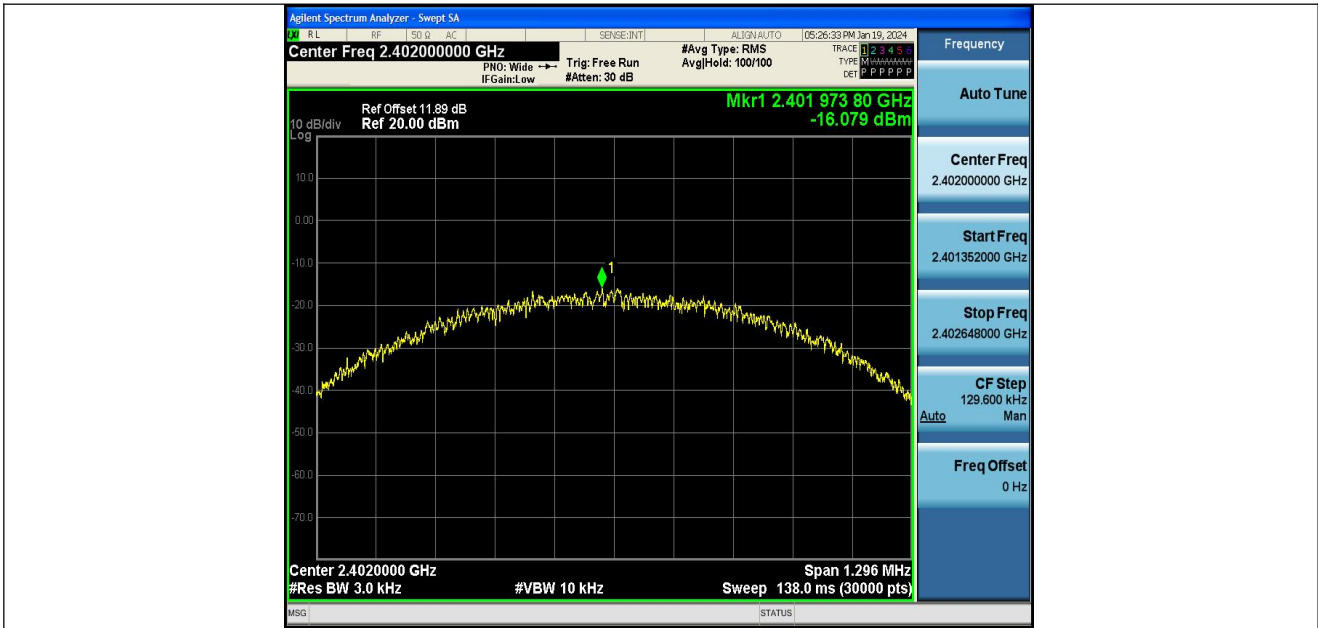


### 10.3 Test Result

| Test Mode | Antenna | Frequency[MHz] | Result[dBm/3kHz] | Limit[dBm/3kHz] | Verdict |
|-----------|---------|----------------|------------------|-----------------|---------|
| BLE_1M    | Ant1    | 2402           | -16.08           | ≤8.00           | PASS    |
| BLE_1M    | Ant1    | 2440           | -16.46           | ≤8.00           | PASS    |
| BLE_1M    | Ant1    | 2480           | -16.41           | ≤8.00           | PASS    |



Test Graphs:

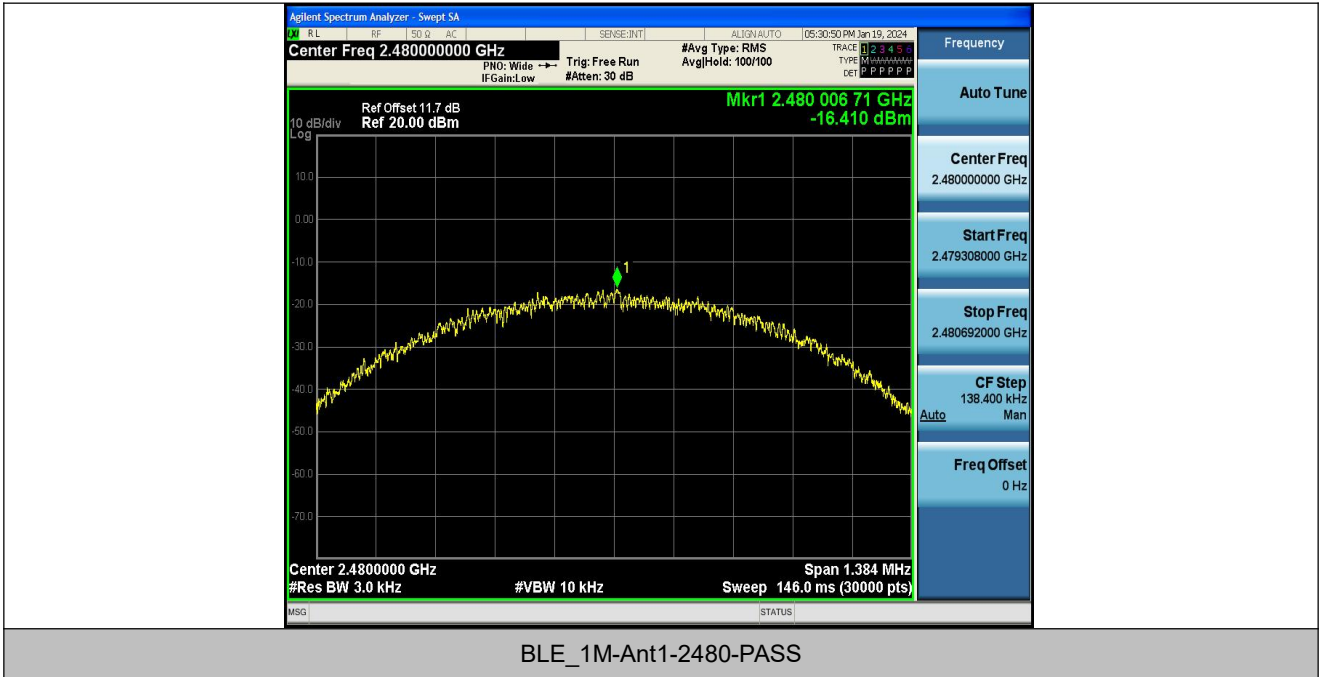


BLE\_1M-Ant1-2402-PASS



BLE\_1M-Ant1-2440-PASS





BLE\_1M-Ant1-2480-PASS



## **11 Antenna Application**

### **11.1 Antenna Requirement**

For intentional device, according to FCC 47 CFR 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. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

### **11.2 Result**

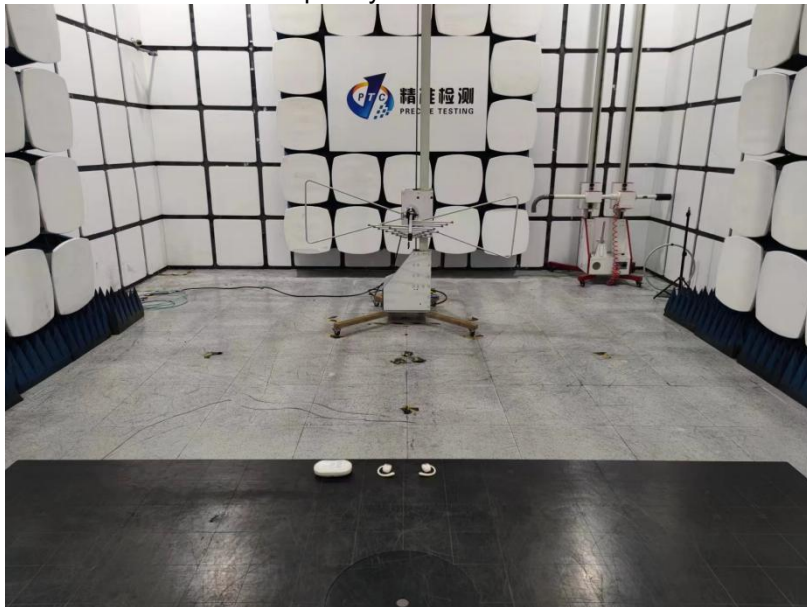
The antenna is Ceramic Antenna which permanently attached, and the best case gain of the antenna is 3dBi. It complies with the standard requirement.

## 12 Test Setup

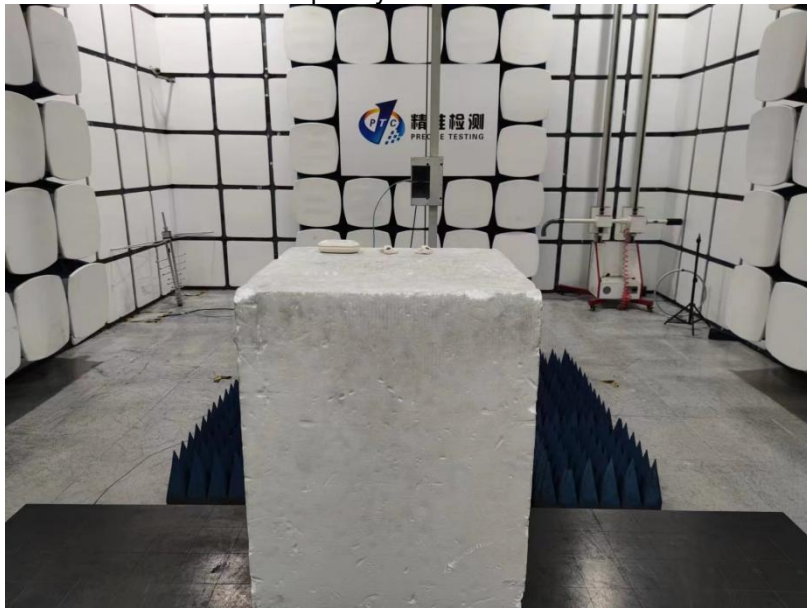
Conducted Emissions



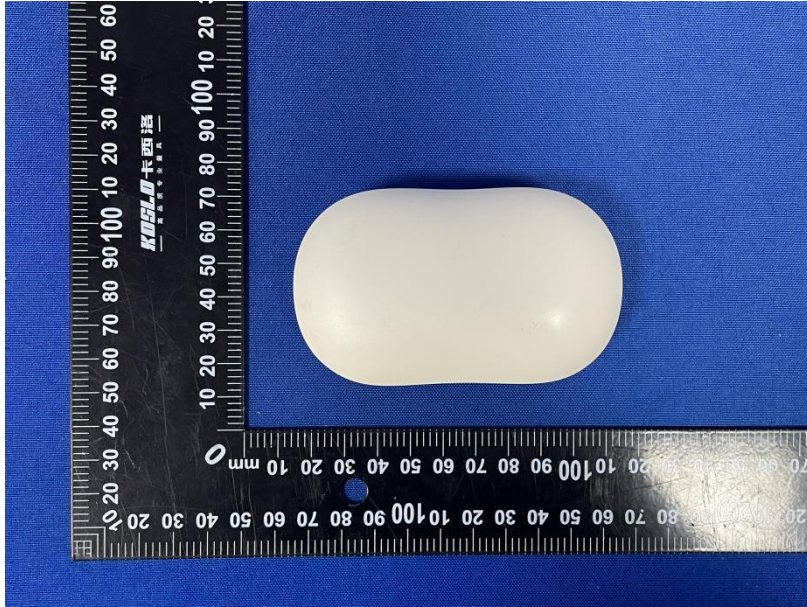
Radiated Spurious Emissions  
Test Frequency From Below 30MHz



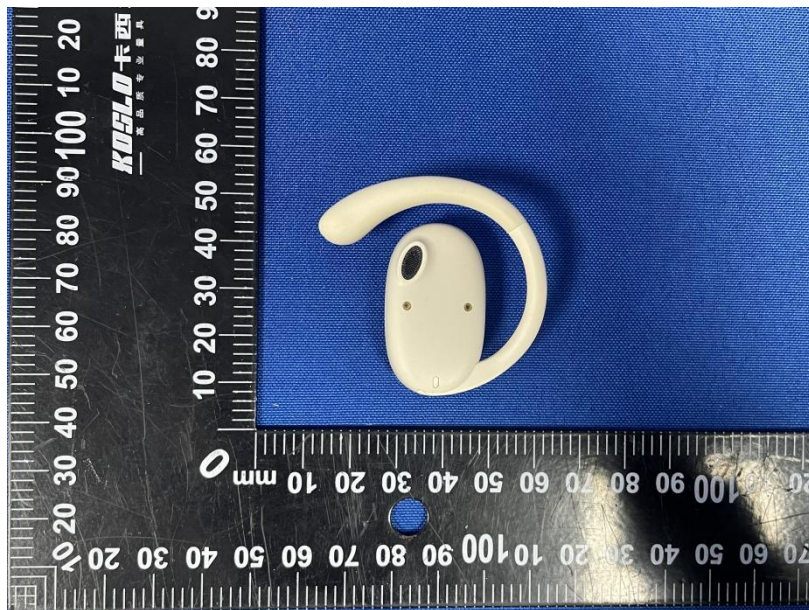
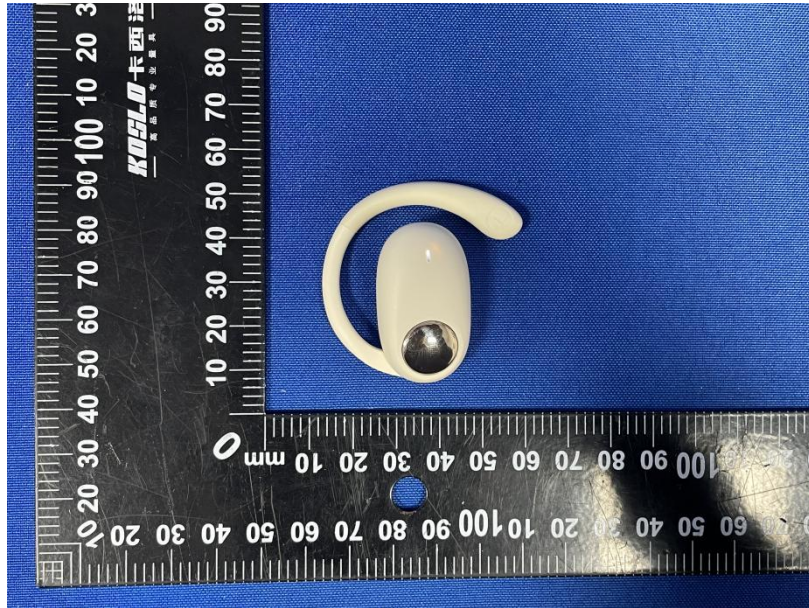
Test frequency from Above 1GHz

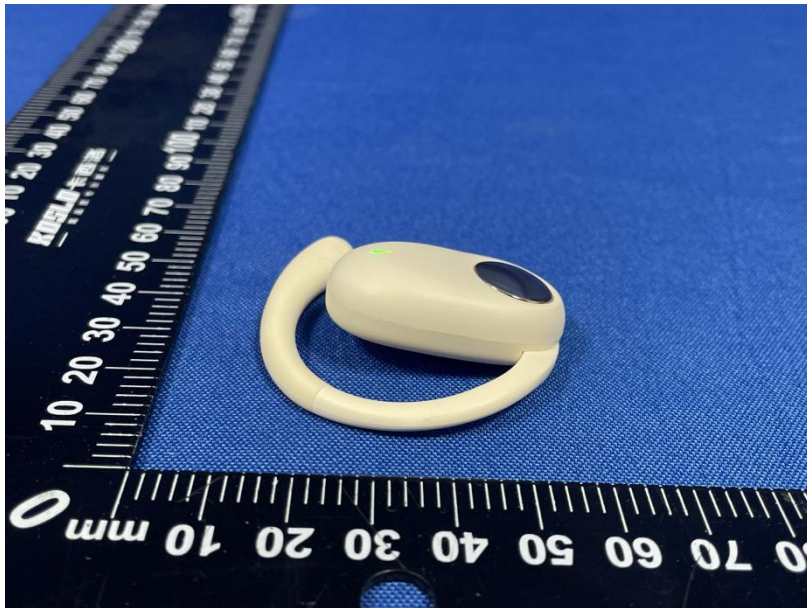


### 13 EUT Photos

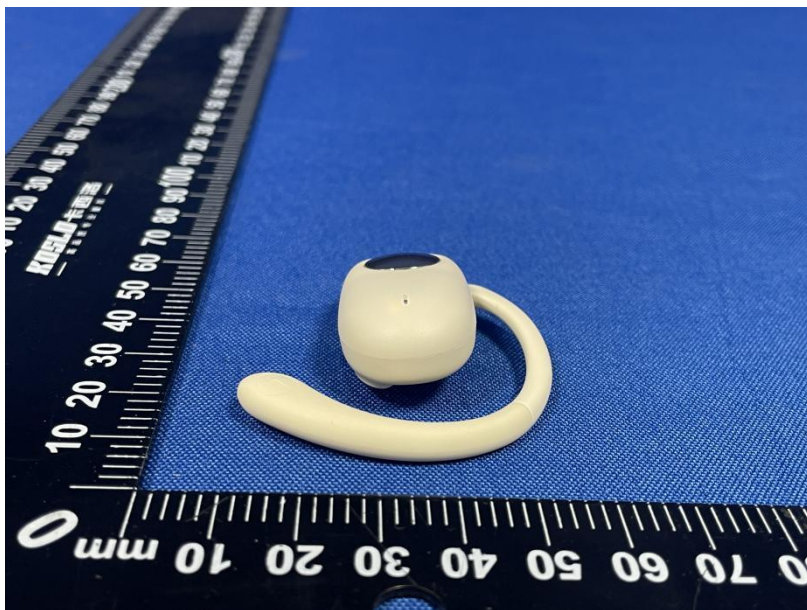


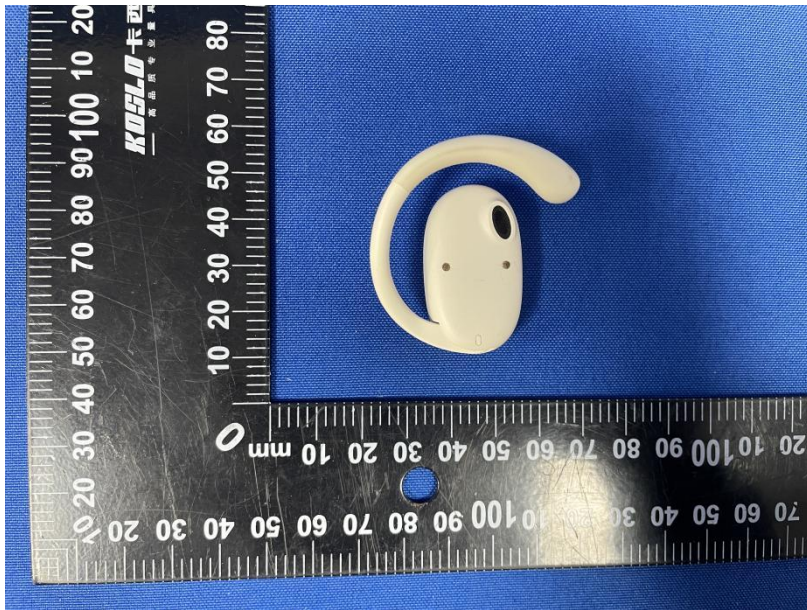
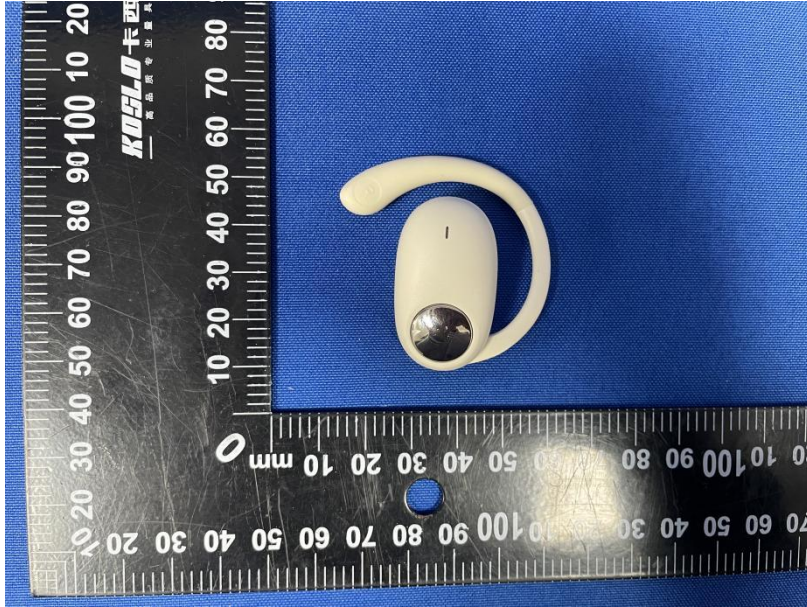


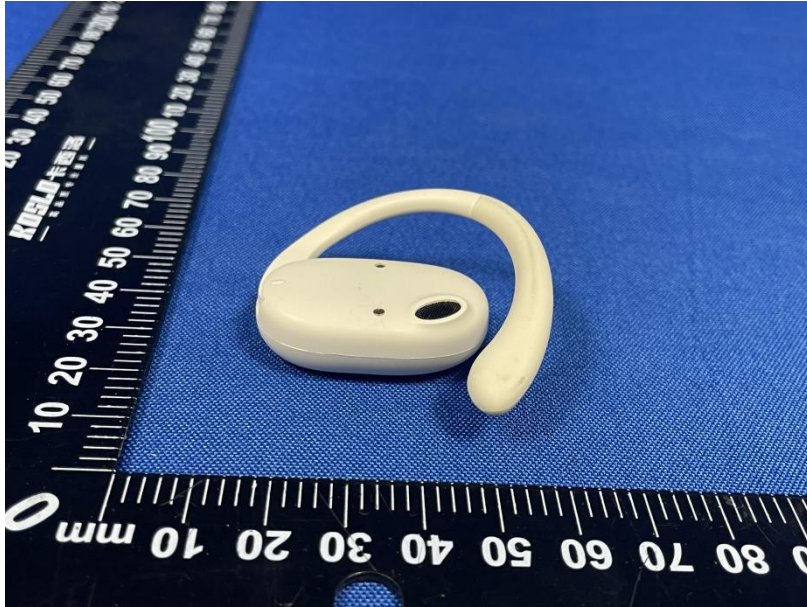




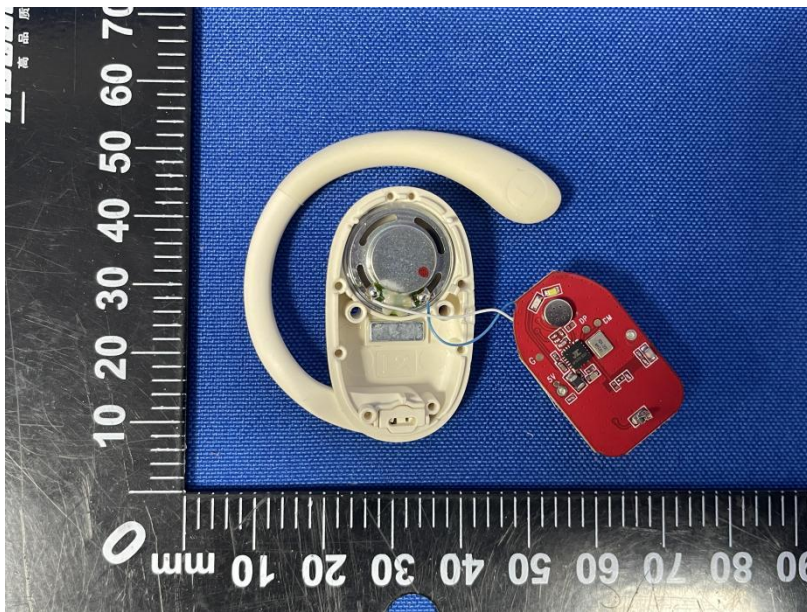
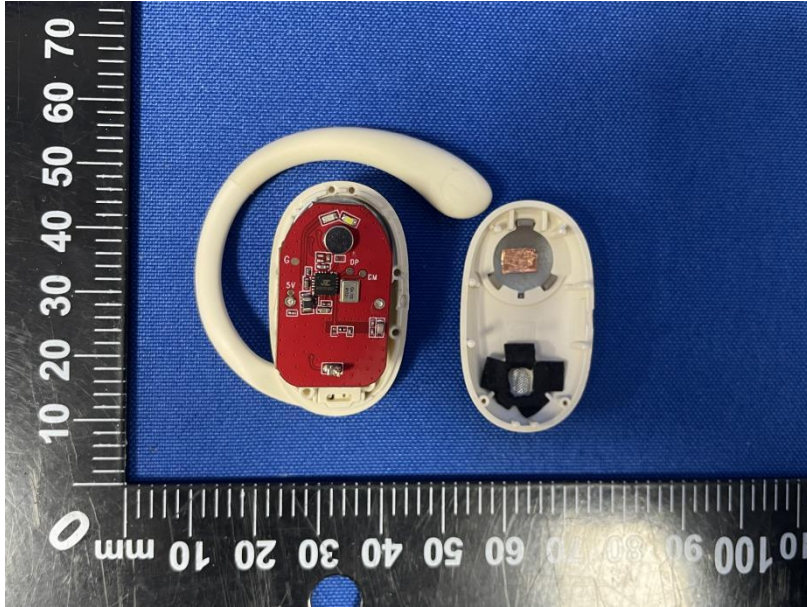


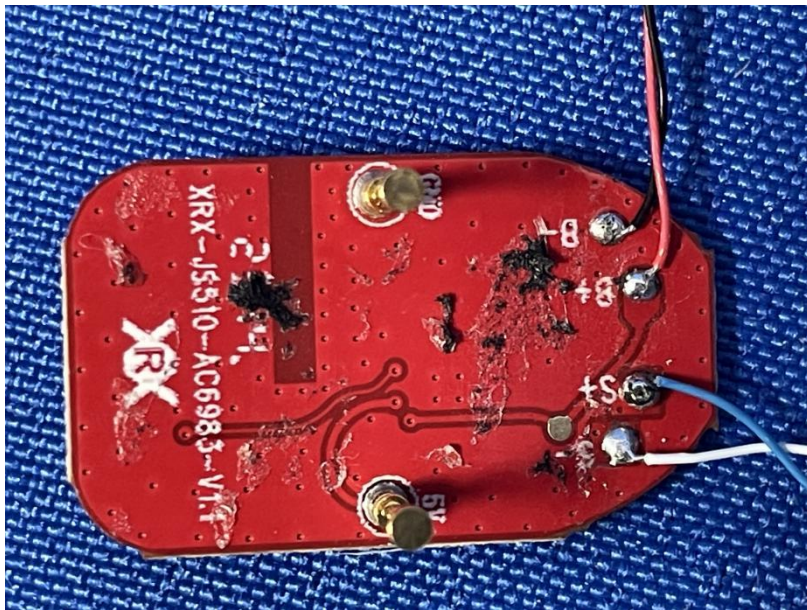
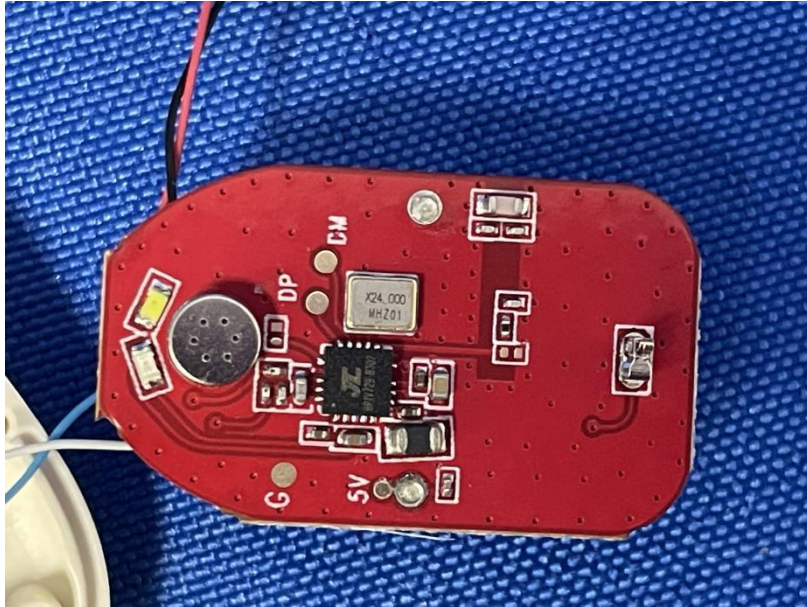


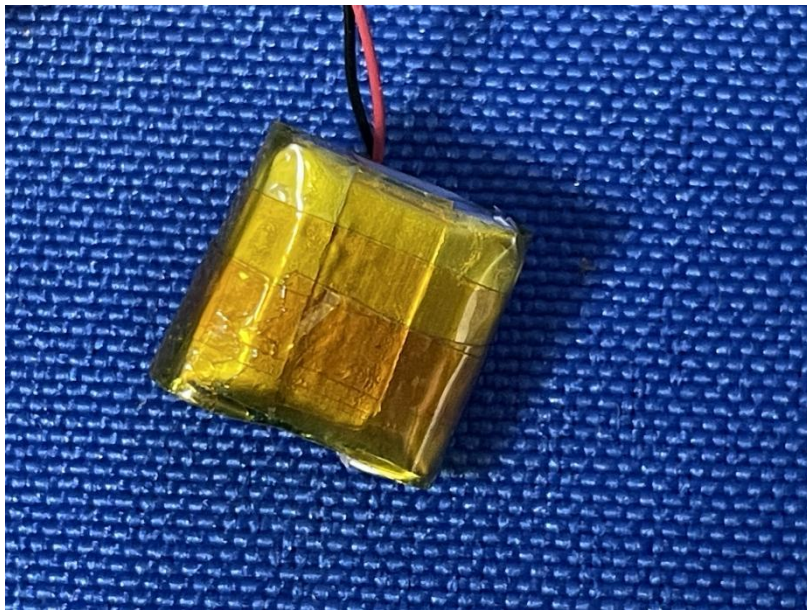
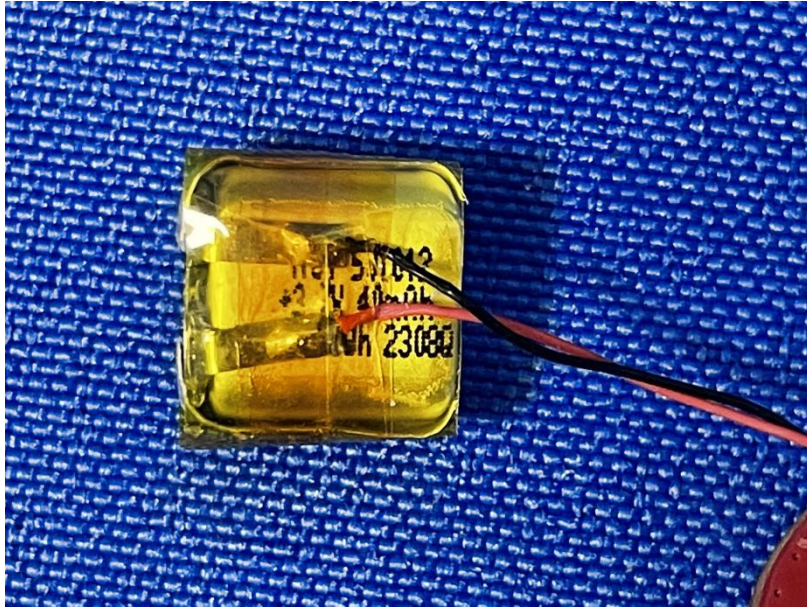


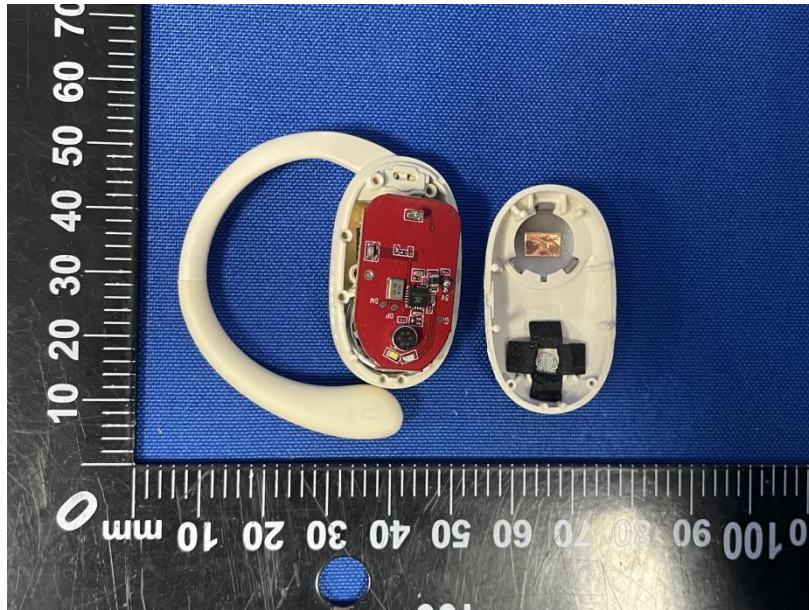




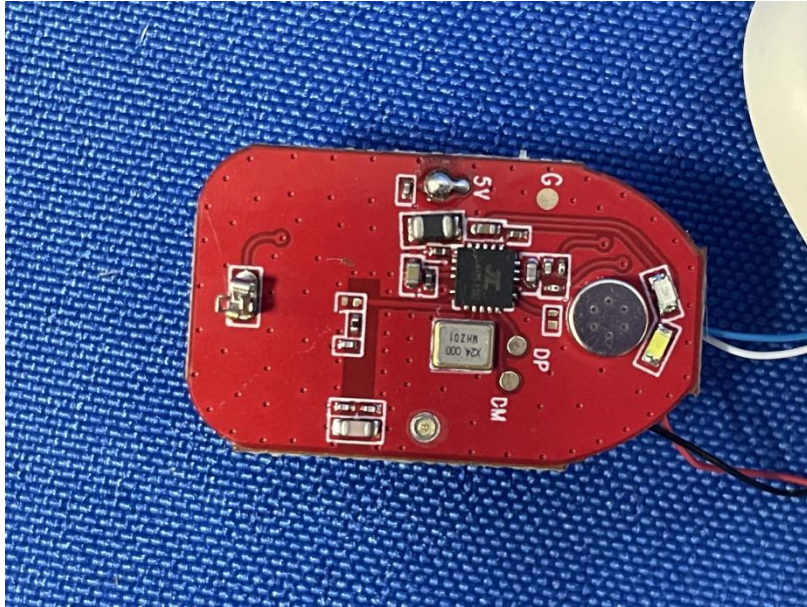


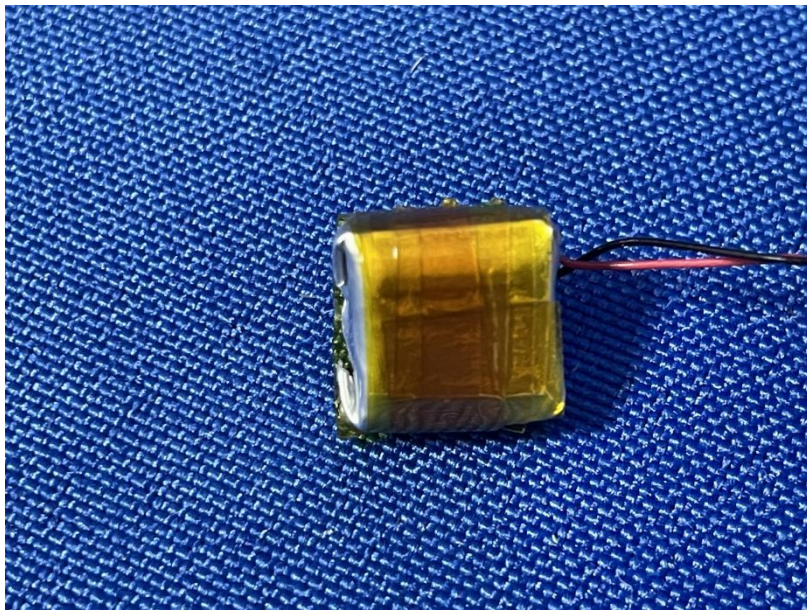
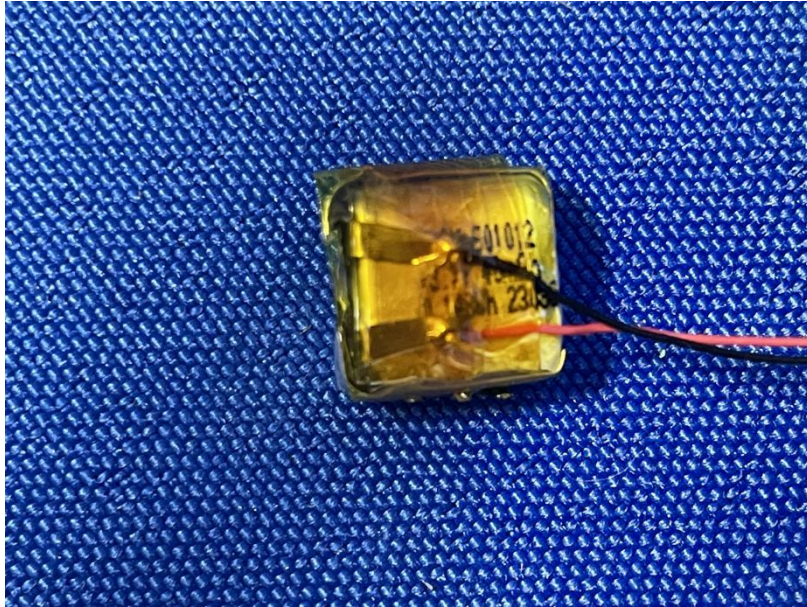












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