TCT 通测检测
TESTING CENTRE TECHNOLOGY

# TEST REPORT

| | | |
|---|---|---|
| **FCC ID. .....:** | 2BELW-VT106 | |
| **Test Report No..... :** | TCT240108E060 | |
| **Date of issue..... :** | Feb. 01, 2024 | |
| **Testing laboratory ..... :** | SHENZHEN TONGCE TESTING LAB | |
| **Testing location/ address:** | 2101 & 2201, Zhenchang Factory, Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, 518103, People's Republic of China | |
| **Applicant's name..... :** | Shenzhen Baihang Technology Co., Ltd | |
| **Address..... :** | Rentian community, Fuhai Street, 8#2303 zhongliangfenghuangli Huayuan, Shenzhen, Guangdong, 518103 China | |
| **Manufacturer's name ... :** | Dong guan Utopia-Originality Technology co., Ltd | |
| **Address..... :** | NO.2, moushan Road, Chan'an Town, Dongguan City, Guangdong Province, China | |
| **Standard(s) ..... :** | FCC CFR Title 47 Part 1.1310<br>KDB 680106 D01 RF Exposure Wireless Charging App v03r01 | |
| **Product Name..... :** | Power Bank | |
| **Trade Mark ..... :** | veektomx | |
| **Model/Type reference..... :** | VT106C, VT106L | |
| **Rating(s)..... :** | Rechargeable Li-ion Battery DC 3.7V | |
| **Date of receipt of test item ..... :** | Jan. 08, 2024 | |
| **Date (s) of performance of test..... :** | Jan. 08, 2024 ~ Feb. 01, 2024 | |
| **Tested by (+signature) ... :** | Brews XU | Brews XU |
| **Check by (+signature).... :** | Beryl ZHAO | Beryl Zhao |
| **Approved by (+signature):** | Tomsin | Tomsin |

SHENZHEN TONGCE TESTING LAB TCT

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# 1. General Product Information

## 1.1. EUT description

| | |
|---|---|
| **Product Name.....:** | Power Bank |
| **Model/Type reference.....:** | VT106C |
| **Sample Number.....:** | TCT240108E059-0101 |
| **Operation Frequency .....:** | 321.8KHz |
| **Output power……...:** | 2.5W |
| **Modulation Technology .....:** | Load modulation |
| **Antenna Type.....:** | Inductive loop coil Antenna |
| **Rating(s).....:** | Rechargeable Li-ion Battery DC 3.7V |

## 1.2. Model(s) list

| No. | Model No. | Tested with |
|---|---|---|
| 1 | VT106C | ☒ |
| Other models | VT106L | ☐ |
| Note: VT106C is tested model, VT106C and VT106L are identical in circuit and PCB layout, only the output port and output power of the cable are different. So the test data of VT106C can represent the remaining models. | | |

# 2. General Information

## 2.1. Test environment and mode

| Operating Environment: | | |
|---|---|---|
| Condition | Conducted Emission | Radiated Emission |
| Temperature: | 23.5 °C | 24.2 °C |
| Humidity: | 52 % RH | 51 % RH |
| Atmospheric Pressure: | 1010 mbar | 1010 mbar |
| Test Mode: | | |
| AC mode | Type-C Input + wireless discharging (battery status>95%) | |
| | Type-C Input + wireless discharging (battery status<50%) | |
| | Type-C Input + wireless discharging (battery status<1%) | |
| Internal Battery Mode | Wireless charging (battery status>95%) | |
| | Wireless charging (battery status<50%) | |
| | Wireless charging (battery status<1%) | |
| The sample was placed 0.8m for the measurement below 1GHz above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case(Z axis) are shown in Test Results of the following pages. | | |

# 3. Facilities and Accreditations

## 3.1. Facilities

The test facility is recognized, certified, or accredited by the following organizations:

- FCC - Registration No.: 645098
  SHENZHEN TONGCE TESTING LAB
  Designation Number: CN1205
  The testing lab has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.
- IC - Registration No.: 10668A-1
  SHENZHEN TONGCE TESTING LAB
  CAB identifier: CN0031
  The testing lab has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

## 3.2. Location

SHENZHEN TONGCE TESTING LAB
Address: 2101 & 2201, Zhenchang Factory, Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, 518103, People's Republic of China
TEL: +86-755-27673339

# 4. Technical Requirements Specification

## 4.1. Requirements

According to the item 5 of KDB 680106 D01 RF Exposure Wireless Charging App v03r01:

(1) Power transfer frequency is less than 1 MHz.
**Wireless power transfer operation frequency is 323.60K.**

(2) Output power from each primary coil is less than or equal to 15 watts.
**The output power is 2.5W**

(3) The system may consist of more than one source primary coils, charging one or more clients. If more than one primary coil is present, the coil pairs may be powered on at the same time.
**Device only capable of wireless power transfer between one sourse and one client at a time, only allow wireless power transfer to take place through a single pair of coils at any given time, and it use one overlapping smaller coil in a charging zone.**

(4) Client device is placed directly in contact with the transmitter.
**Direct contact**

(5) Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).
No

(6) The aggregate H-field strengths at 15 cm surrounding the device and 20 cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.
Yes

**Limits**

The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

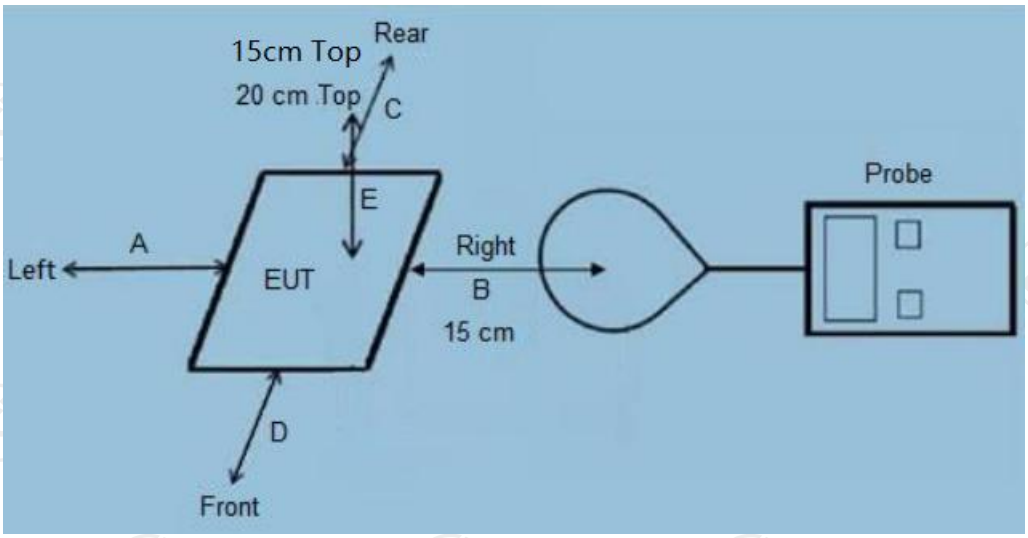
Limits for Maximum Permissible Exposure (MPE)

| Frequency range (MHz) | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density (mW/cm$^2$) | Averaging time (minutes) |
|---|---|---|---|---|
| (A) Limits for Occupational/Controlled Exposures | | | | |
| 0.3-3.0 | 614 | 1.63 | *(100) | 6 |
| 3.0-30 | 1842/f | 4.89/f | *(900/f$^2$) | 6 |
| 30-300 | 61.4 | 0.163 | 1.0 | 6 |
| 300-1500 | / | / | f/300 | 6 |
| 1500-100,000 | / | / | 5 | 6 |
| (B) Limits for General Population/Uncontrolled Exposure | | | | |
| 0.3-1.34 | 614 | 1.63 | *(100) | 30 |
| 1.34-30 | 824/f | 2.19/f | *(180/f$^2$) | 30 |
| 30-300 | 27.5 | 0.073 | 0.2 | 30 |
| 300-1500 | / | / | f/1500 | 30 |
| 1500-100,000 | / | / | 1.0 | 30 |

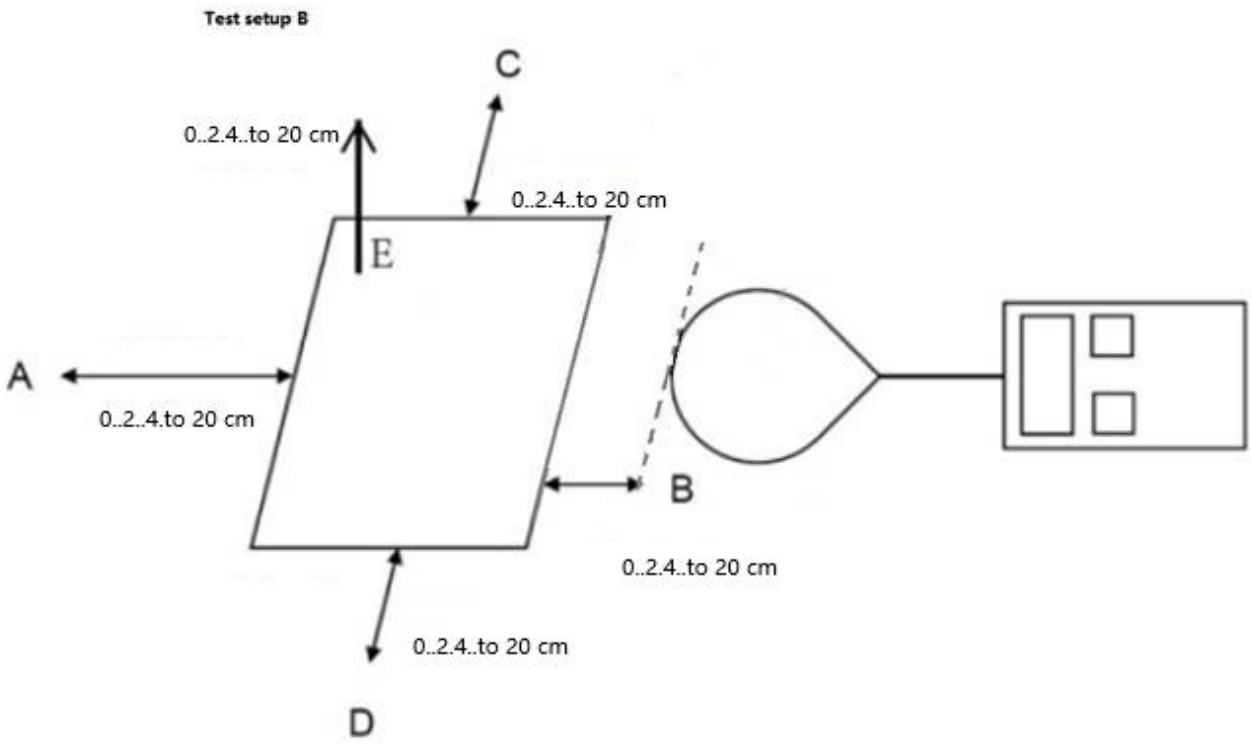
F=frequency in MHz
*=Plane-wave equivalent power density
RF exposure compliance will need to be determined with respect to 1.1307(c) and (d) of the FCC rules. The emissions should be within the limits at 300kHz in Table 1 of 1.1310(use the 300kHz limits for 150kHz:614V/m,1.63A/m).

## 4.2. Test Setup

A:




B:



## 4.3. Test Procedure

1) The RF exposure test was performed in an echoic chamber;

2) The measurement probe was placed at test distance(15 cm from edges, 20 cm and 15cm from top) Which is between the edge of the charger and the geometric center of probe, for test setup A;

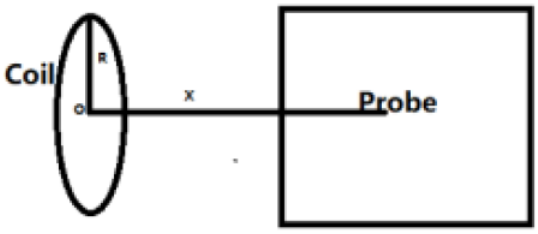
3) In addition to what is described in KDB 680106 D01, please measure and provide magnetic and electrical field strength at a distance 0cm to 20cm at 2cm iteration, i.e. at a distance of 0cm, 2cm, 4cm, ……. 20cm. Which is between the edge of the charger and the edge of of probe, for test setup B;

4) The highest emission leve laws recorded and compared with limit as soon as measurement of each points (A,B, C,D, E)were completed;

5) According to the requirements if KDB 680106 D01 v04, If the center of the probe sensing element is located more than 5 mm (The sensitive elements are located approximately 8 mm below the external surface specified in user manual of EHP-200A) from the probe outer surface, the field strengths need to be estimated through modeling for those positions that are not reachable;

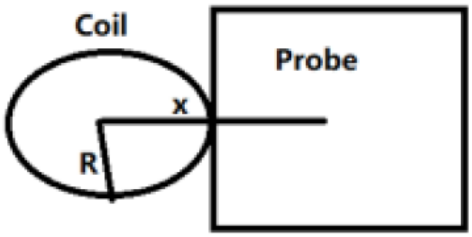
6) Use **Biot-Savart Law**, the value of 0 cm can be estimated through the results of 2 cm, according to the formula:

**Top & Bottom Side:**




$$B = \frac{\mu_0 * I * N * R^2}{2 * (R^2 + x^2)^{3/2}}$$

**Front, left, right & rear Side:**




$$B = \frac{\mu_0 * I * N}{2 * x}$$

**Remark:**
B: H-field(Unit:T)
$u_0$: Space permeability=4*pi*$10^{-7}$
I (Unit: A): The current element passing through a radiated coil.
R: Radius of radiated coil, according to the coil specification: R=0.02m
X: The distance from the sensing elements of the probe to the edge of the radiated coil (the dimensions of EUT and load are take into account) (Unit: m)
N: Turns of the radiated coil, according to the coil specification: N=14.

## 4.4. Test Instruments List

| Equipment | Manufacturer | Model No. | Serial No. | Calibration Due |
|---|---|---|---|---|
| Electric and Magnetic Field Analyzer | Narda | EHP-200A | 180ZX20511 | Jul. 04, 2024 |
| Adapter | jinhu | WC065A11JH | J121083BA1003016 | / |
| Apple Watch | Apple | Apple Watch A1757 | / | / |

## 4.5. Test Result

**Note: EUT mode: wireless output 2.5 W**
**Test Result for Test setup A:**
**AC power in mode**

**E-Filed Strength at (15 cm from edges A, B, C, D, 20 cm and 15cm from top E) surrounding the EUT (V/m)**

| Charging Load Worse case | Test Position A (V/m) | Test Position B (V/m) | Test Position C (V/m) | Test Position D (V/m) | Test Position E (V/m)20cm | Test Position E (V/m)15cm | Limits (V/m) |
|---|---|---|---|---|---|---|---|
| <1% | 0.53 | 0.69 | 0.67 | 0.76 | 0.52 | 0.77 | 614 |
| 50% | 0.37 | 0.65 | 0.54 | 0.64 | 0.43 | 0.68 | 614 |
| >95% | 0.36 | 0.31 | 0.55 | 0.53 | 0.44 | 0.66 | 614 |

**H-Filed Strength at (15 cm from edges A, B, C, D, 20 cm and 15cm from top E) surrounding the EUT (A/m)**

| Charging Load Worse case | Test Position A(A/m) | Test Position B(A/m) | Test Position C(A/m) | Test Position D(A/m) | Test Position E(A/m)20cm | Test Position E(A/m)15cm | Limits (A/m) |
|---|---|---|---|---|---|---|---|
| <1% | 0.031 | 0.028 | 0.030 | 0.026 | 0.028 | 0.028 | 1.63 |
| 50% | 0.029 | 0.028 | 0.029 | 0.028 | 0.027 | 0.028 | 1.63 |
| >95% | 0.028 | 0.029 | 0.027 | 0.026 | 0.028 | 0.027 | 1.63 |

**Test Result for Test setup B:**

**Internal battery power mode.**

**<1%, 50%, >95% load all have been tested, only worse case Max load (<1%) is reported.**

**H-Filed Strength at (distance 0cm to 20cm at 2cm iteration, i.e. at a distance of 20cm, 18cm, 16cm, ……. 0cm, Which is between the edge of the charger and the edge of of probe,) surrounding the EUT (A/m)**

| Test distance (cm) | Test Position A(A/m) | Test Position B(A/m) | Test Position C(A/m) | Test Position D(A/m) | Test Position E(A/m) | Test Position F(A/m) | Limits (A/m) |
|---|---|---|---|---|---|---|---|
| 2 | 0.180 | 0.172 | 0.194 | 0.165 | 0.116 | 0.108 | 1.63 |
| 4 | 0.119 | 0.091 | 0.127 | 0.114 | 0.038 | 0.037 | 1.63 |
| 6 | 0.083 | 0.079 | 0.085 | 0.069 | 0.028 | 0.029 | 1.63 |
| 8 | 0.058 | 0.055 | 0.062 | 0.053 | 0.027 | 0.028 | 1.63 |
| 10 | 0.050 | 0.046 | 0.052 | 0.043 | 0.028 | 0.027 | 1.63 |
| 12 | 0.039 | 0.036 | 0.044 | 0.040 | 0.029 | 0.027 | 1.63 |
| 14 | 0.033 | 0.032 | 0.041 | 0.033 | 0.028 | 0.028 | 1.63 |
| 16 | 0.030 | 0.029 | 0.028 | 0.027 | 0.027 | 0.026 | 1.63 |
| 18 | 0.028 | 0.029 | 0.029 | 0.028 | 0.028 | 0.028 | 1.63 |
| 20 | 0.029 | 0.027 | 0.028 | 0.028 | 0.027 | 0.027 | 1.63 |

Use the Biot-Savart Law to estimated the results of 2cm through 4 cm.

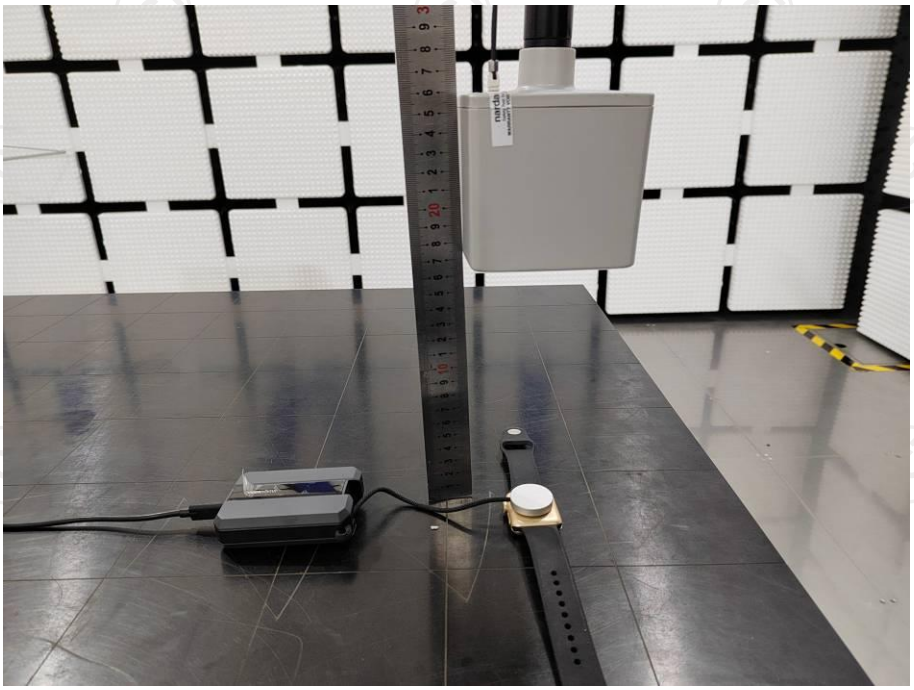
| Test position | Measure Value(A/m) | Estimated Value (A/m) | Agreement Ratio | Limits |
|---|---|---|---|---|
| A | 0.180 | 0.197 | 9.44% | 30% |
| B | 0.172 | 0.151 | 12.21% | 30% |
| C | 0.194 | 0.210 | 8.25% | 30% |
| D | 0.165 | 0.189 | 14.55% | 30% |
| E | 0.116 | 0.107 | 7.76% | 30% |
| F | 0.108 | 0.096 | 11.11% | 30% |

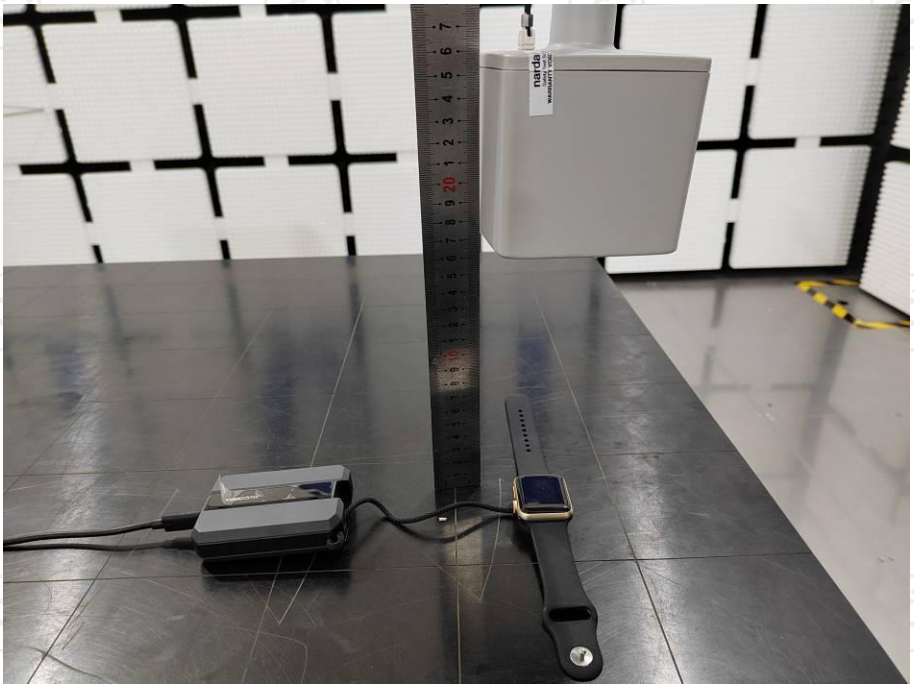
As the model is sufficient, the value of 0cm can be estimated through the results of 2 cm

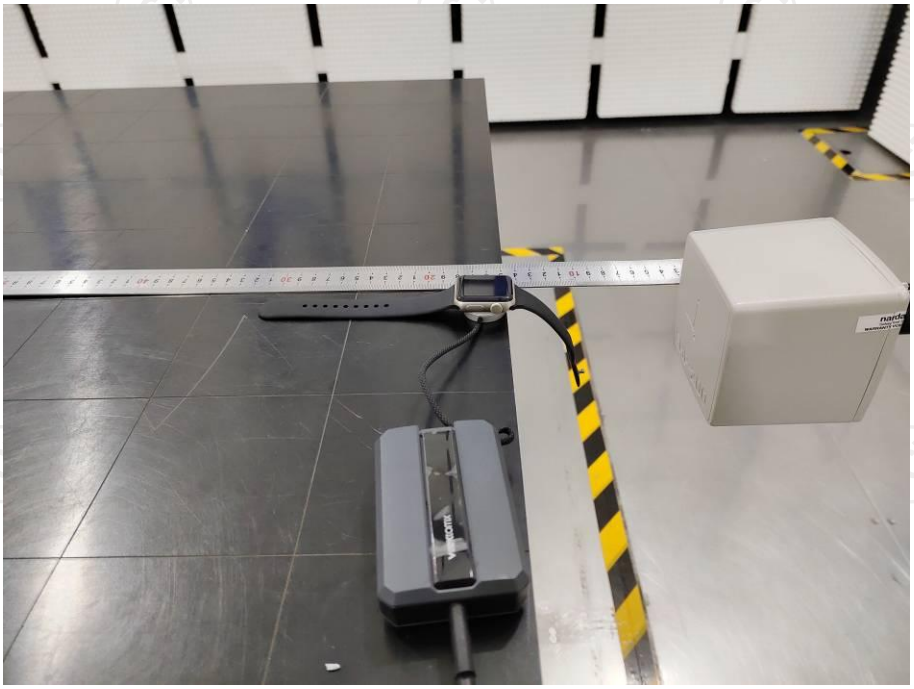
| Test position | Estimated Value (A/m) | Limits(A/m) |
|---|---|---|
| A | 0.522 | 1.63 |
| B | 0.500 | |
| C | 0.563 | |
| D | 0.479 | |
| E | 0.532 | |
| F | 0.496 | |

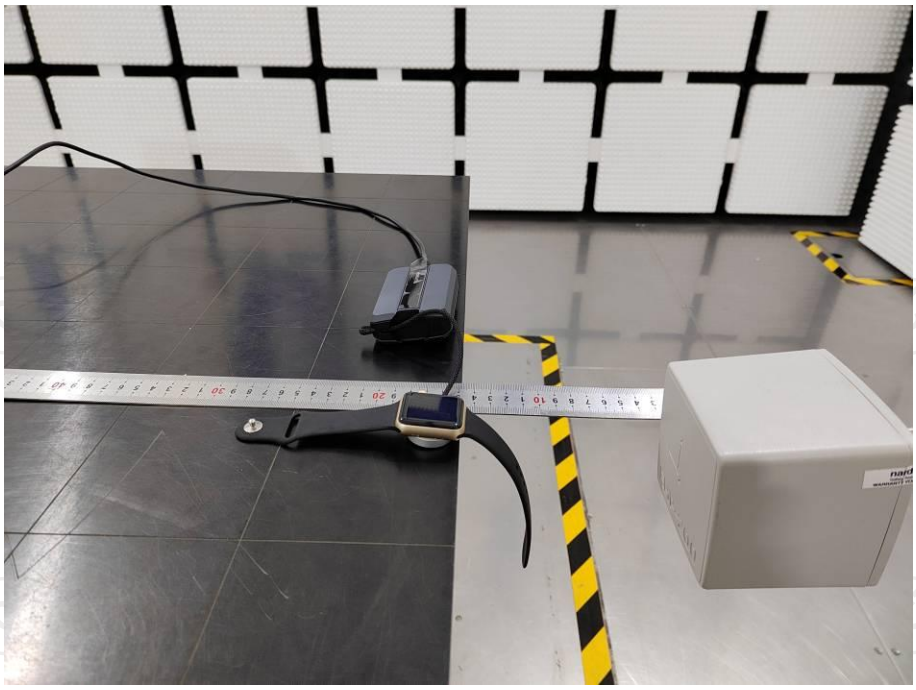
## 4.6. Test Set-up Photo

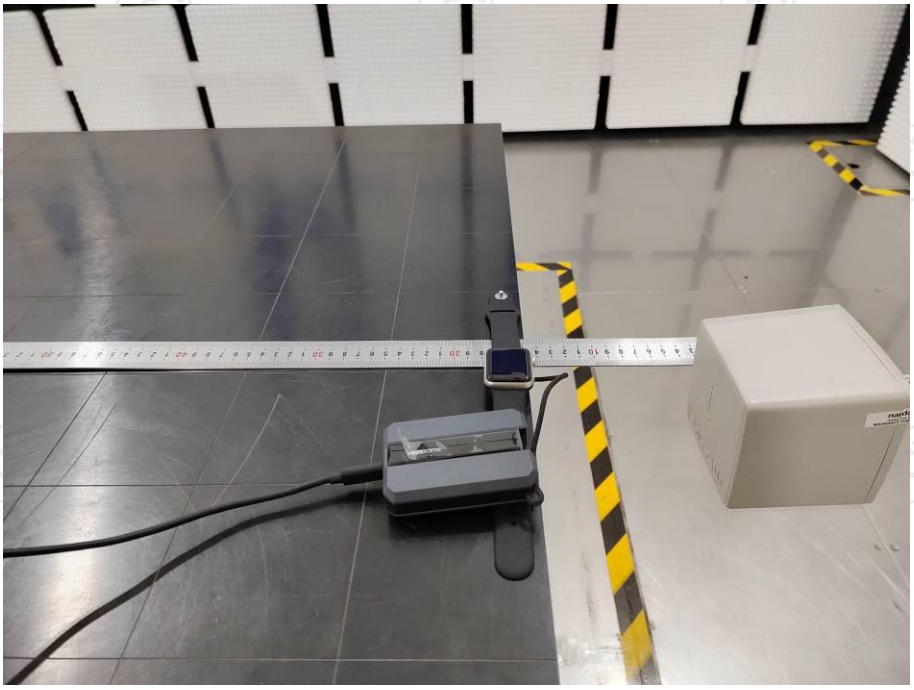
**AC in mode**



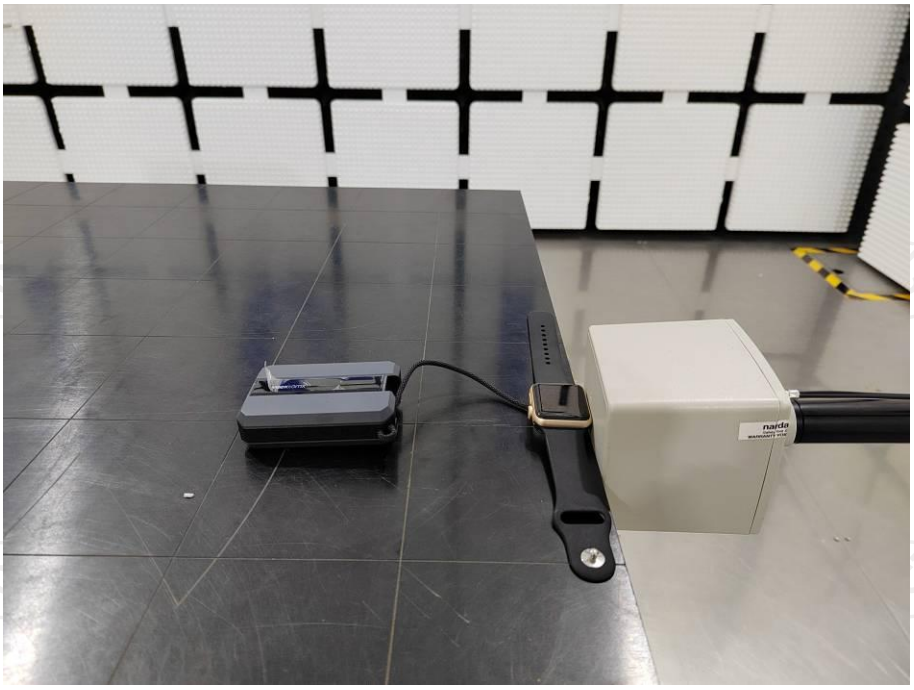


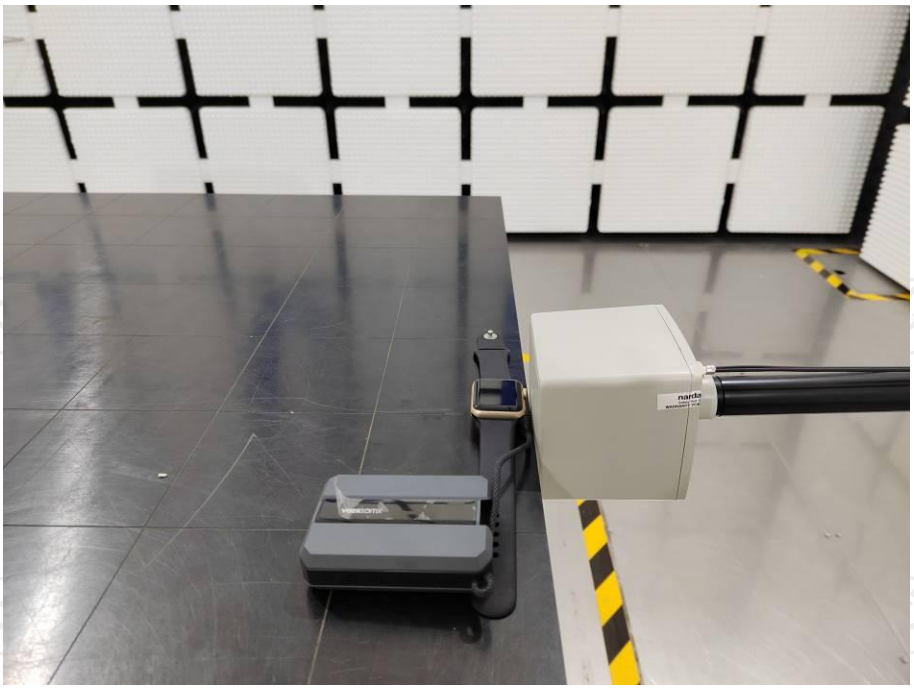






**Internal battery mode**





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