# RF EVALUATION TEST REPORT

| | |
|---|---|
| Applicant…… | : Dongguan Leaper Electronic Technology CO.,LTD |
| Address……... | : NO.22, Xinbao second Street, Dalang new town, Dongguan City, China |
| Manufacturer…….. | : Dongguan Leaper Electronic Technology CO.,LTD |
| Address……... | : NO.22, Xinbao second Street, Dalang new town, Dongguan City, China |
| Factory…… | : Dongguan Leaper Electronic Technology CO.,LTD |
| Address…….. | : NO.22, Xinbao second Street, Dalang new town, Dongguan City, China |
| Product Name…… | : Cork Fast Wireless Charging Mouse Pad |
| Brand Name……..... | : N/A |
| Model No. ……... | : WS21008 |
| FCC ID……..... | : 2AZ4X-WS21008-1 |
| Measurement Standard……. | : 47 CFR PART 2, Section 2.1093 |
| Receipt Date of Samples…. | : May 13, 2024 |
| Date of Tested…… | : May 14, 2024 to June 24, 2024 |
| Date of Report…… | : June 26, 2024 |

This report shows that above equipment is technically compliant with the requirements of the standards above. All test results in this report apply only to the tested sample(s). Without prior written approval of Dongguan Nore Testing Center Co., Ltd, this report shall not be reproduced except in full.

Prepared by

Jenny Liu / Project Engineer

Approved by

Iori Fan / Authorized Signatory

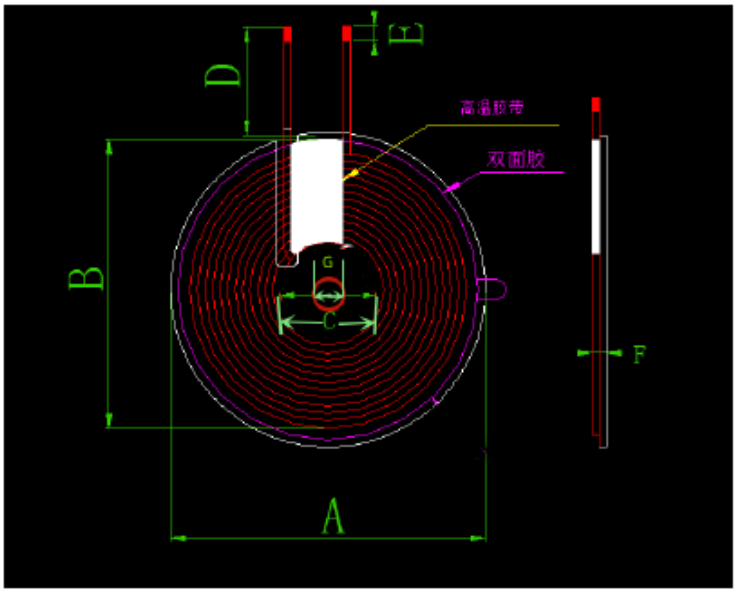
**Table of Contents**

## Revision History

| Report Number | Description | Issued Date |
|---|---|---|
| NTC2405172F01 | Initial Issue | 2023-06-26 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

## 1. General Description of EUT

| | |
|---|---|
| **Product Information** | |
| Product Name: | Cork Fast Wireless Charging Mouse Pad |
| Main Model Name: | WS21008 |
| Additional Model Name: | N/A |
| Model Difference: | N/A |
| S/N: | 2405-2283 |
| Brand Name: | N/A |
| Hardware Version: | wirelesscharging-WS21008 |
| Software Version: | leader.2021.11 |
| Rating: | Input: DC 5V 2A, DC 9V 1.5A<br>Wireless Output: 5W, 7.5W, 10W |
| Typical Arrangement: | Table-top |
| I/O Port: | Refer to user manual |
| **Accessories Information** | |
| Adapter: | N/A |
| Cable: | USB cable: 0.95m, unshielded, detachable |
| Other: | N/A |
| **Additional Information** | |
| Note: | N/A |
| Remark: | All the information above are provided by the manufacturer. More detailed feature of the EUT please refers to the user manual. |

| Technical Specification | |
|---|---|
| Frequency Range: | 110.5-205KHz |
| Modulation Type: | FSK |
| Antenna Type: | Coil antenna |
| Output power for each coil: | 10W, 7.5W, 5W |
| Distance to transmitter: | Transmitter to Top: 0.77mm<br>Transmitter to Bottom: 0.77mm<br>Transmitter to Left: 6.3cm<br>Transmitter to Right: 23.7cm<br>Transmitter to Front:10cm<br>Transmitter to Rear:10cm |
| Size: | 一、尺寸 DIMENSION:(mm)<br>  |
| Remark: | The information above are provided by the manufacturer. More detailed feature of the EUT please refers to the user manual. |

| | |
|---|---|
| A | 40.0±1.0 |
| B | 36.5±1 |
| C | 13.5±0.5 |
| D | 25±3 |
| E | 4±2 |
| F | 2.2±0.2 |
| G | 5.3 ref |
| H | |
| I | |
| M | |
| J | |
| K | |
| | |
| | |
| | |

注：
1.交叉出线;
2.出线位置缠 8mm(ref)宽度高温胶纸 1-2Ts;

## 2. Test Facility and Location

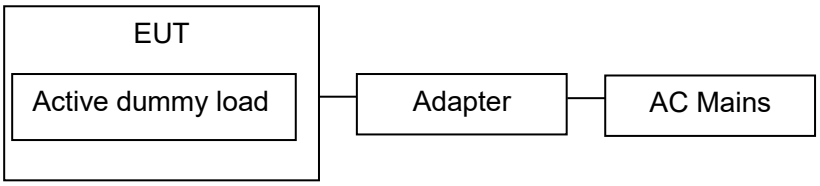
| Test Site | : | Dongguan Nore Testing Center Co., Ltd. (Dongguan NTC Co., Ltd.) |
|---|---|---|
| Accreditations and Authorizations | : | The Laboratory has been assessed and proved to be in compliance with CNAS/CL01<br>Listed by CNAS, August 13, 2018<br>The Certificate Registration Number is L5795.<br>The Certificate is valid until August 13, 2024<br><br>The Laboratory has been assessed and proved to be in compliance with ISO17025<br>Listed by A2LA, November 01, 2017<br>The Certificate Registration Number is 4429.01<br><br>Listed by FCC, November 06, 2017<br>Test Firm Registration Number: 907417<br><br>Listed by Industry Canada, June 08, 2017<br>The Certificate Registration Number. Is 46405-9743A |
| Test Site Location | : | Building D, Gaosheng Science and Technology Park, Hongtu Road, Nancheng District, Dongguan City, Guangdong Province, China |

## 3. Test Modes Detail

| Test Mode | Test Setup Configuration | Remark |
|---|---|---|
| 1. | wireless charging (5W) | Full Load, Half Load, Empty Load |
| 2. | wireless charging (7.5W) | Full Load, Half Load, Empty Load |
| 3. | wireless charging (10W) | Full Load, Half Load, Empty Load |
| Note: Only the worst case records in the report. | | |

## 4. Configuration of EUT

Powered by external AC/DC Adapter




## 5. Modification of EUT

No modifications are made to the EUT during all test items.

## 6. Description of Support Device

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| No. | Equipment | Brand | M/N | S/N | Cable Specification | Remarks |
|---|---|---|---|---|---|---|
| 1. | Wireless Charging Load | YBZ | 001 | --- | --- | Provided by the Lab. |
| 2. | Adapter | HUAWEI | HW-200325CP0 | --- | --- | Provided by the Lab. |

## 7. Deviations and Abnormalities from Standard Conditions

No additions, deviations and exclusions from the standard.

## 8. Applicable Standards and References

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

**Test Standards:**

47 CFR Part 1, 1.1307(b) and 1.1310

KDB 680106 D01v04

## 9. Equipment approval considerations

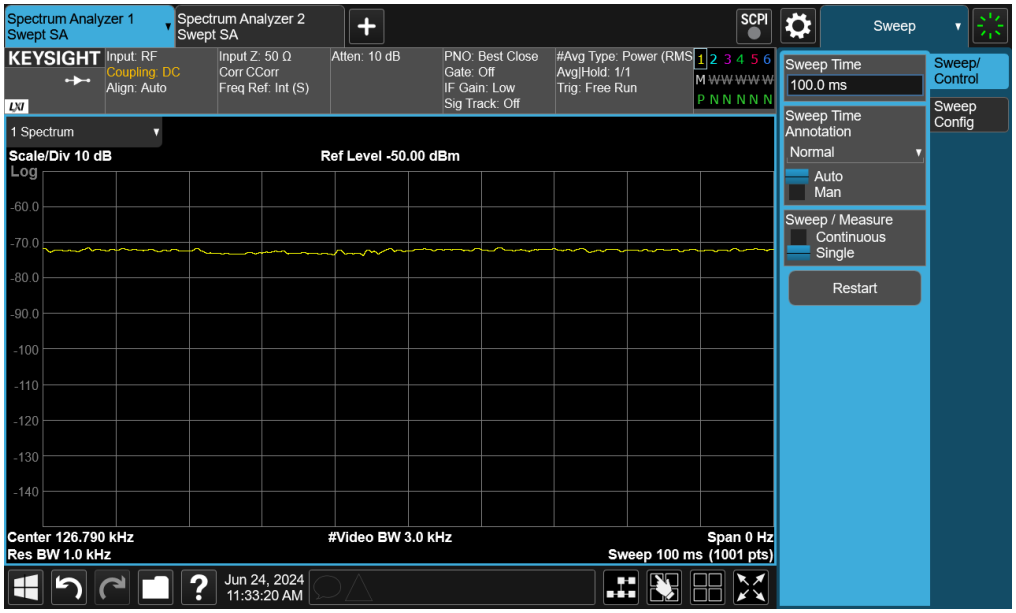
| No. | Requirements | Conditions of the EUT |
|---|---|---|
| 1. | WPT operating frequency (or frequencies). | 110.5~205KHz |
| 2. | Number of radiating structure (Coil) | Only one coil |
| 3. | Conducted Power for each radiating structure | The maximum power is 10W |
| 4. | § 2.1091-Mobile or § 2.1093-Portable demonstrated scenarios of operation, including RF exposure compliance information | Mobile and Portable Device |
| 5. | Maximum distance from the WPT transmitter at which, by design, a load can be charged (including slow-charging operations) | Charging with the load contact directly |

## 10. Measurement Uncertainty

| No. | Test Item | Uncertainty | Remarks |
|---|---|---|---|
| 1. | Magnetic Field Emissions | ±0.15 dB | --- |
| 2. | Electric Field Emissions | ±0.36 dB | --- |
| **Note:** This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2. | | | |

## 11. Duty Cycle

| Frequency Range (kHz) | Test Mode | Ton (ms) | Ton+off | Duty Cycle (%) | Remarks |
|---|---|---|---|---|---|
| 110.5~205 | 3 | --- | --- | 100% | Reference only |



## 12. Maximum Permissible Exposure

**LIMIT**

| Frequency range (MHz) | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density (mW/cm2) | 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/f2) | 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/f2) | 30 |
| 30-300 | 27.5 | 0.073 | 0.2 | 30 |
| 300-1500 | / | / | f/1500 | 30 |
| 1500-100,00 | / | / | 1.0 | 30 |

F=frequency in MHz

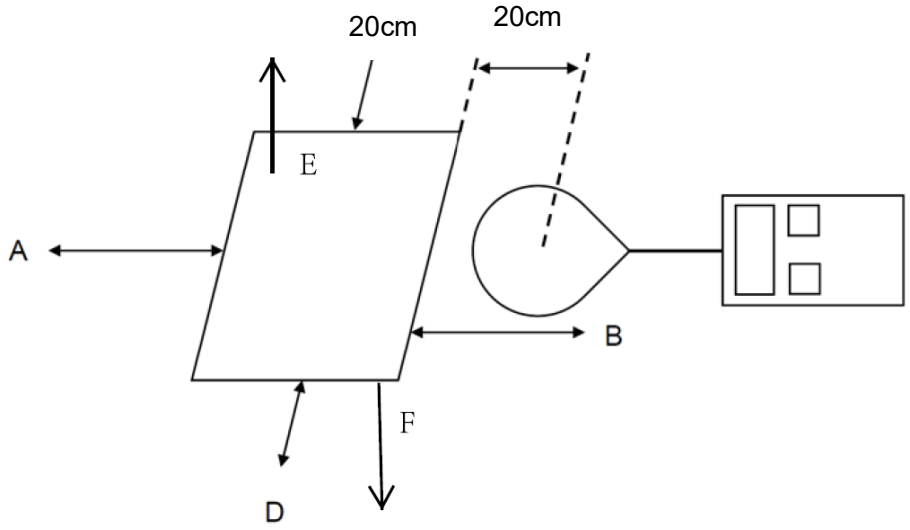
*=Plane-wave equivalent power density

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).

Per KDB 680106 D01 v04, RF exposure evaluation at 20cm surrounding the device and 20cm above the top surface. Emission between 50 kHz to 300 kHz should be assessed versus the limits at 300 kHz in Table 1 of Section 1.1310: 1.63/Am and aggregate H-field strengths from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.

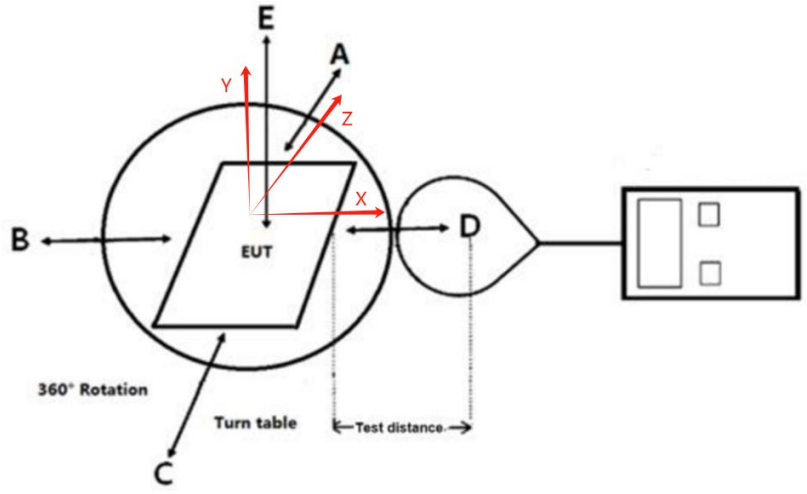
## BLOCK DIAGRAM OF TEST SETUP

**For Mobile:**




Note: The distance of the points A/B/C/D/E is 20cm.

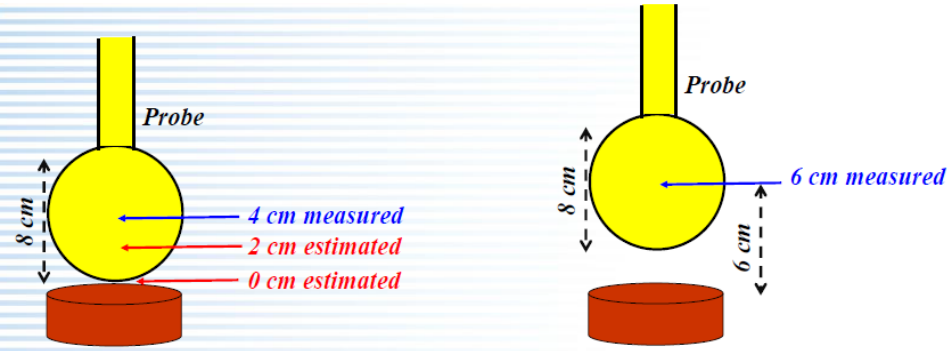
**For Portable:**




Note: The distance of the points A/B/C/D/E/F is 2, 4, 6, 8, 10, 12, 14, 16, 18, 20cm.

The values tested by the probe are X, Y, and Z on three axes perpendicular to the edge of the device. Top and bottom side coincident with the axis (Y) of the main coil.

Perform H-field/E-field measurements are taken along all three axes the device from 0cm~20cm in 2cm minimum increment for each edge surface of the host/client pair. If the center of the probe sensing element is more than 5mm from the probe outer edge, the field strengths need to be estimated for the positions that are not reachable.




*Example of probe measurements in points close to the device surface: estimates compared with measurements at 4 and 6 cm provide validation*

According to Calibration information and specification about ETL-400 Probe, The Probe ETL-400 Probe's sensitive elements center is located in the probe's center, and the dimensions is 12.5x12.5mm. So the actual 0cm field strengths need to be estimated for the positions that are not reachable. The Extrapolated Value Calculation Method please Refer item 7) . And the result of test distance 2cm~20cm was measured value.

| Probe | Length | Width | Radius |
|---|---|---|---|
| | 12.5cm | 12.5cm | 6.25cm |

Note: The device is a coil emitting structure, just need to evaluated H-field.

**TEST PROCEDURES**

For mobile exposure conditions:

a. The RF exposure test was performed in anechoic chamber;

b. E and H-field measurements should be made with the center of the probe at a distance of 20cm surrounding the EUT.

c. The highest emission level was recorded and compared with limit.

d. The EUT was measured according to the dictates of KDB 680106 v04.

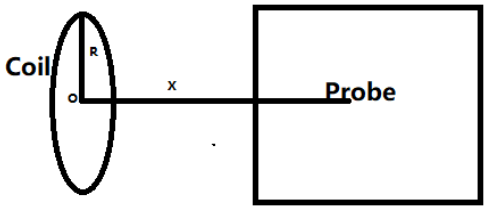
For portable exposure conditions:

a. The RF exposure test was performed in anechoic chamber;

b. H-field measurements should be made along all three axes the device from 0cm~20cm in 2cm minimum increment for each edge surface of the host/client pair. If the center of the probe sensing element is more than 5mm from the probe outer edge, the field strengths need to be estimated for the positions that are not reachable, and the estimation methods are:

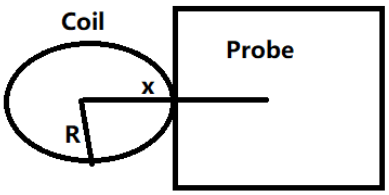
- determine the distance from the test probe's sensitive elements to the probe tip based on the calibration information and/or specification of the test probe.
- Use Biot-Savart law, equation and the measured value building mathematical model, where Biot-Savart equation is:

**Top & Bottom Side:**




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

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




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

Where:

**B:** means H-field value;

**$\mu_0$**: is space permeability, μ0=4π*$10^{-7}$;

**I:** A current element passing through a coil;

**R**: The distance from the center point of the wireless charging device to other edges;

**x**: means the evaluated point to the coil center. (For top & bottom side: x=test distance; For other side: x=test distance + R)

**N**: Number of turns, According to provided “Antenna specification” files: N=12

- Validate numerical calculation model through the probe measurements for the two closest points the device surface, and with 2cm increments, to ensure the value to show a 30% agreement between the model and the probe measurements.
- Estimate H-field strengths for the positions that are not reachable via numerical calculation.

c. Test performed with all the radiating structures operating at maximum power at the same time.

d. The highest emission level was recorded and compared with limit.

e. The EUT was measured according to the dictates of KDB 680106 v04

**TEST RESULTS**

PASS

Please refer to the following pages of the worst case (10W wireless charging).

**Validation results for the numerical calculation model:**

| Test Position | Distance (cm) | Measured H-Field (A/m) | Estimated H-Field (A/m) | Agreement Ratio (%) | Limit (%) | Result |
|---|---|---|---|---|---|---|
| Side A | 8.0 | 0.41 | 0.47 | 13.64 | 30 | PASS |
| | 10.0 | 0.34 | 0.38 | 11.11 | 30 | PASS |
| Side B | 8.0 | 0.34 | 0.38 | 11.11 | 30 | PASS |
| | 10.0 | 0.28 | 0.31 | 10.17 | 30 | PASS |
| Side C | 8.0 | 0.23 | 0.25 | 8.33 | 30 | PASS |
| | 10.0 | 0.18 | 0.19 | 5.41 | 30 | PASS |
| Side D | 8.0 | 0.25 | 0.28 | 11.32 | 30 | PASS |
| | 10.0 | 0.20 | 0.22 | 9.52 | 30 | PASS |
| Side E | 8.0 | 0.74 | 0.76 | 2.67 | 30 | PASS |
| | 10.0 | 0.62 | 0.64 | 3.17 | 30 | PASS |
| Side F | 8.0 | 0.69 | 0.71 | 2.86 | 30 | PASS |
| | 10.0 | 0.56 | 0.57 | 1.77 | 30 | PASS |

Note: The percent ratio agreement is the difference between the estimated and measured values divided by the average of the estimated and measured values.

**Measured and Estimated Results**

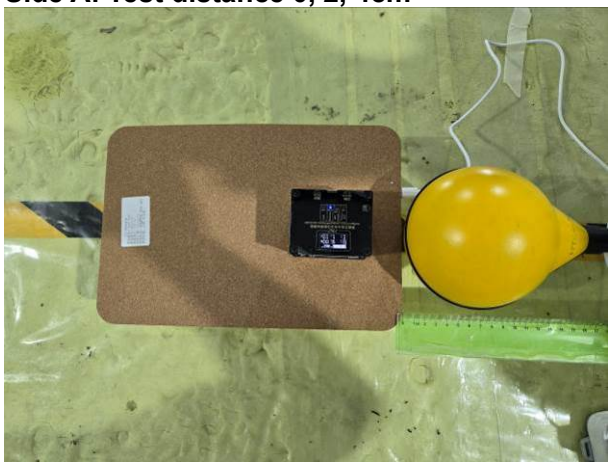
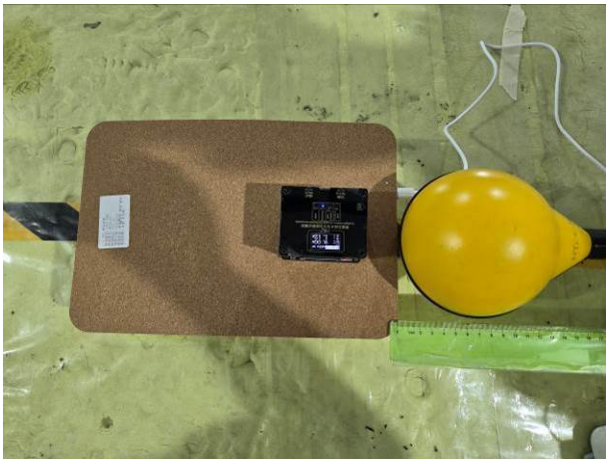
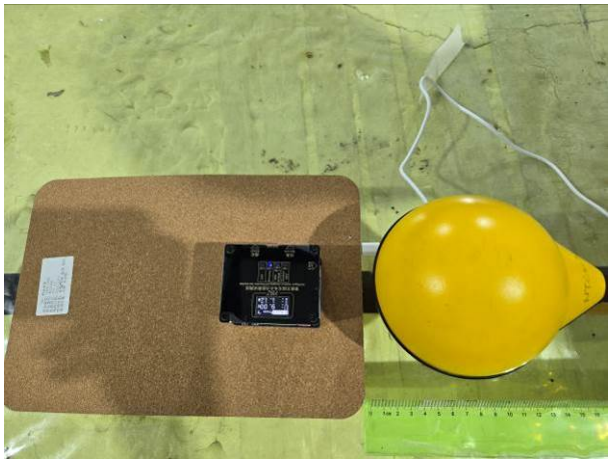
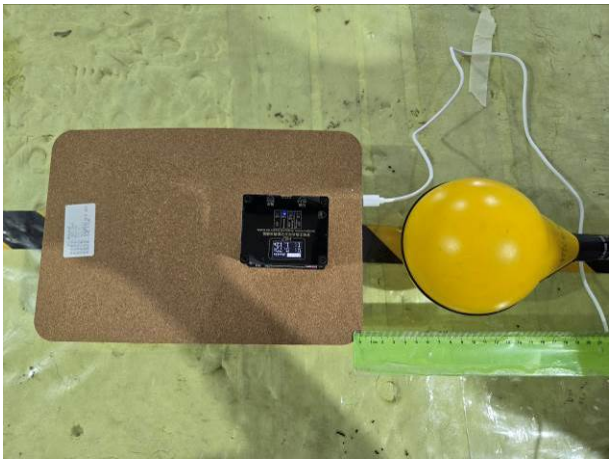
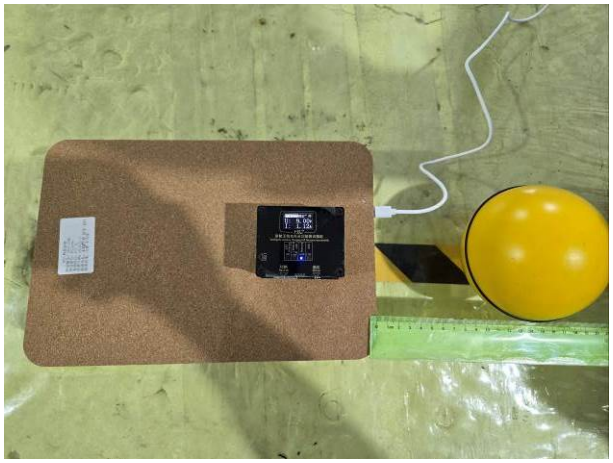
| Test Distance (cm) | Test Position | Type | Probe Measure Result (A/m) | Limit (A/m) |
|---|---|---|---|---|
| 0 | Side A | Estimate | 0.94 | 1.63 |
| | Side B | Estimate | 0.64 | 1.63 |
| | Side C | Estimate | 0.32 | 1.63 |
| | Side D | Estimate | 0.46 | 1.63 |
| | Side E | Estimate | 0.96 | 1.63 |
| | Side F | Estimate | 0.87 | 1.63 |
| 2 | Side A | Estimate | 0.71 | 1.63 |
| | Side B | Estimate | 0.53 | 1.63 |
| | Side C | Estimate | 0.29 | 1.63 |
| | Side D | Estimate | 0.38 | 1.63 |
| | Side E | Estimate | 0.90 | 1.63 |
| | Side F | Estimate | 0.82 | 1.63 |
| 4 | Side A | Estimate | 0.57 | 1.63 |
| | Side B | Estimate | 0.45 | 1.63 |
| | Side C | Estimate | 0.27 | 1.63 |
| | Side D | Estimate | 0.32 | 1.63 |
| | Side E | Estimate | 0.83 | 1.63 |
| | Side F | Estimate | 0.76 | 1.63 |
| 6 | Side A | Estimate | 0.48 | 1.63 |
| | Side B | Estimate | 0.39 | 1.63 |
| | Side C | Estimate | 0.25 | 1.63 |
| | Side D | Estimate | 0.28 | 1.63 |
| | Side E | Estimate | 0.78 | 1.63 |
| | Side F | Estimate | 0.72 | 1.63 |
| 8 | Side A | Measured | 0.41 | 1.63 |
| | Side B | Measured | 0.34 | 1.63 |
| | Side C | Measured | 0.23 | 1.63 |
| | Side D | Measured | 0.25 | 1.63 |
| | Side E | Measured | 0.74 | 1.63 |
| | Side F | Measured | 0.69 | 1.63 |
| 10 | Side A | Measured | 0.34 | 1.63 |
| | Side B | Measured | 0.28 | 1.63 |
| | Side C | Measured | 0.18 | 1.63 |
| | Side D | Measured | 0.20 | 1.63 |
| | Side E | Measured | 0.62 | 1.63 |
| | Side F | Measured | 0.56 | 1.63 |
| 12 | Side A | Measured | 0.28 | 1.63 |
| | Side B | Measured | 0.25 | 1.63 |
| | Side C | Measured | 0.18 | 1.63 |
| | Side D | Measured | 0.19 | 1.63 |
| | Side E | Measured | 0.45 | 1.63 |
| | Side F | Measured | 0.47 | 1.63 |

| | | | | |
|---|---|---|---|---|
| 14 | Side A | Measured | 0.24 | 1.63 |
| | Side B | Measured | 0.22 | 1.63 |
| | Side C | Measured | 0.19 | 1.63 |
| | Side D | Measured | 0.20 | 1.63 |
| | Side E | Measured | 0.34 | 1.63 |
| | Side F | Measured | 0.31 | 1.63 |
| 16 | Side A | Measured | 0.21 | 1.63 |
| | Side B | Measured | 0.19 | 1.63 |
| | Side C | Measured | 0.18 | 1.63 |
| | Side D | Measured | 0.18 | 1.63 |
| | Side E | Measured | 0.30 | 1.63 |
| | Side F | Measured | 0.28 | 1.63 |
| 18 | Side A | Measured | 0.20 | 1.63 |
| | Side B | Measured | 0.18 | 1.63 |
| | Side C | Measured | 0.17 | 1.63 |
| | Side D | Measured | 0.18 | 1.63 |
| | Side E | Measured | 0.24 | 1.63 |
| | Side F | Measured | 0.25 | 1.63 |
| 20 | Side A | Measured | 0.18 | 1.63 |
| | Side B | Measured | 0.18 | 1.63 |
| | Side C | Measured | 0.16 | 1.63 |
| | Side D | Measured | 0.16 | 1.63 |
| | Side E | Measured | 0.21 | 1.63 |
| | Side F | Measured | 0.22 | 1.63 |

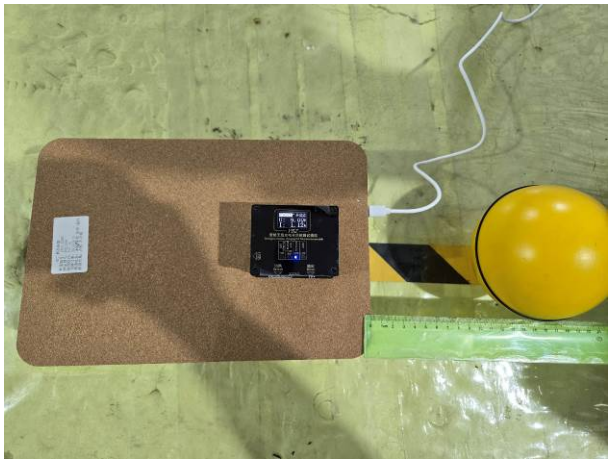
## 13. Test Equipment List

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | Magnetic field probe 100cm2 | Narda | ETL-400 Probe 1Hz-400KHz (r=6.25cm) | O-0167 | June 28,2023 | 1 Year |
| 2. | E-Field Probe | Narda | EP-601 | 611WX70729 | Mar. 23, 2024 | 1 Year |

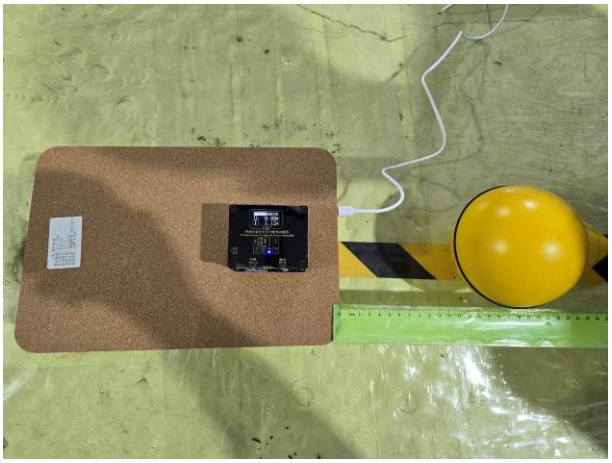
## 14. Test Photos

| | |
|---|---|
| **Side A: Test distance 0, 2, 4cm**<br>  | **Side A: Test distance 6cm**<br>  |
| **Side A: Test distance 8cm**<br>  | **Side A: Test distance 10cm**<br>  |
| **Side A: Test distance 12cm**<br>  | **Side A: Test distance 14cm**<br>  |

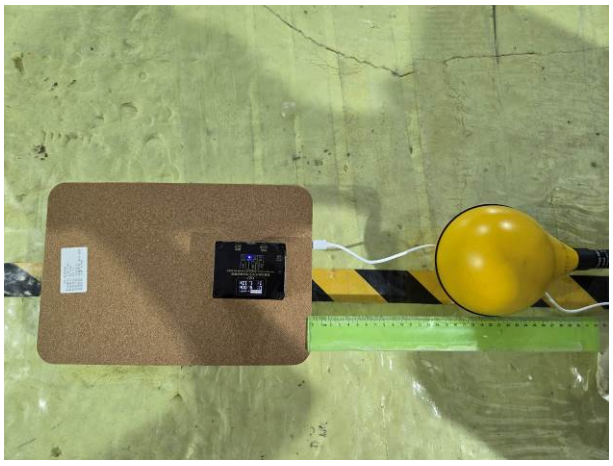
**Side A: Test distance 16cm**



**Side A: Test distance 18cm**



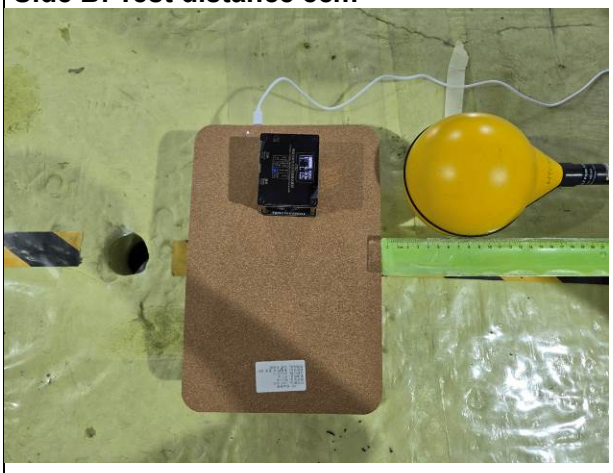
**Side A: Test distance 20cm**



**Side B: Test distance 0,2,4cm**

**Side B: Test distance 6cm**

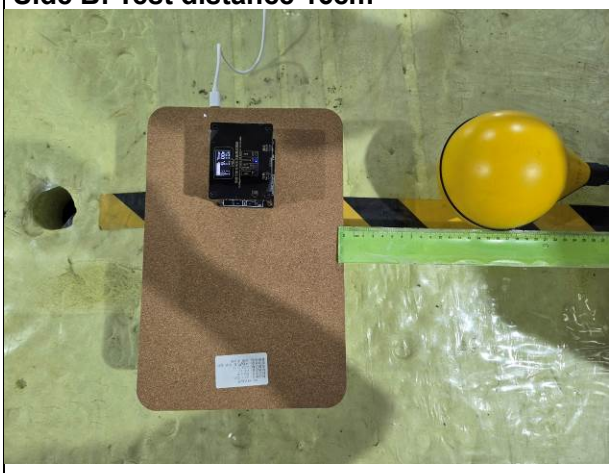
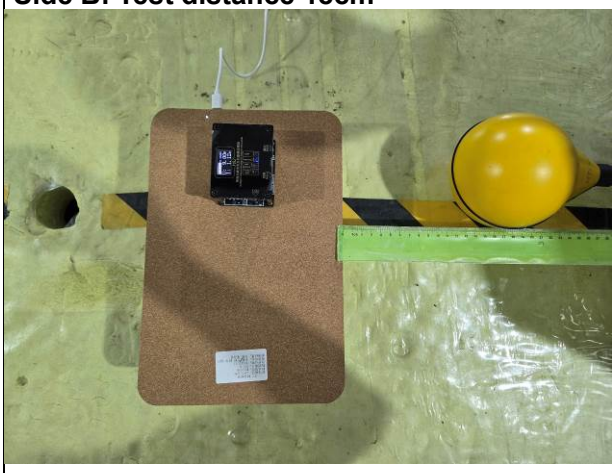
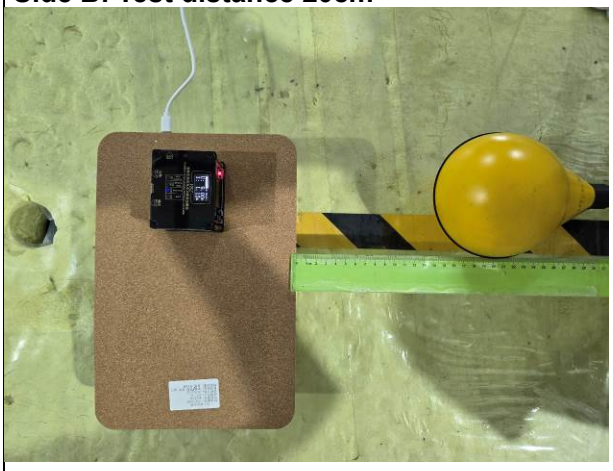
**Side B: Test distance 8cm**

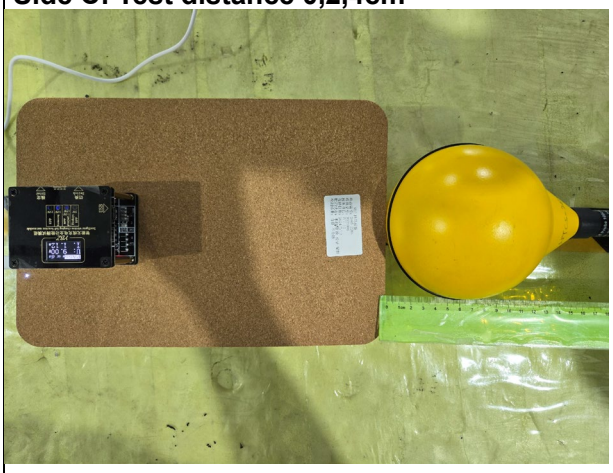
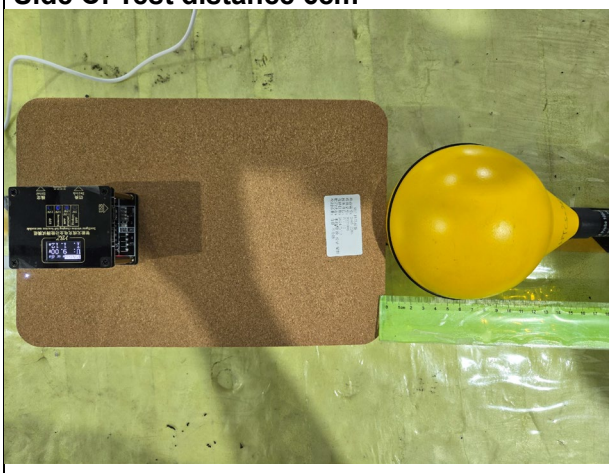
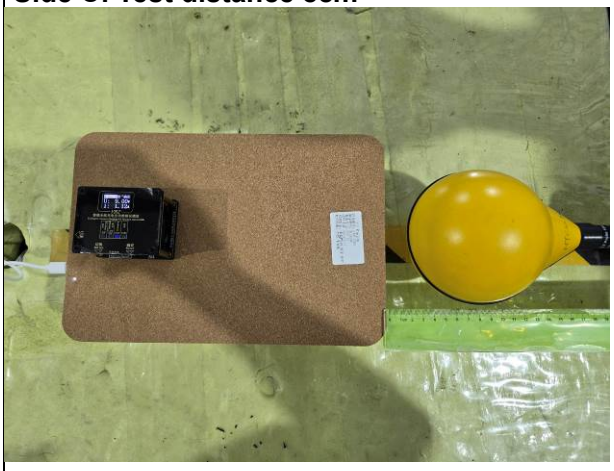
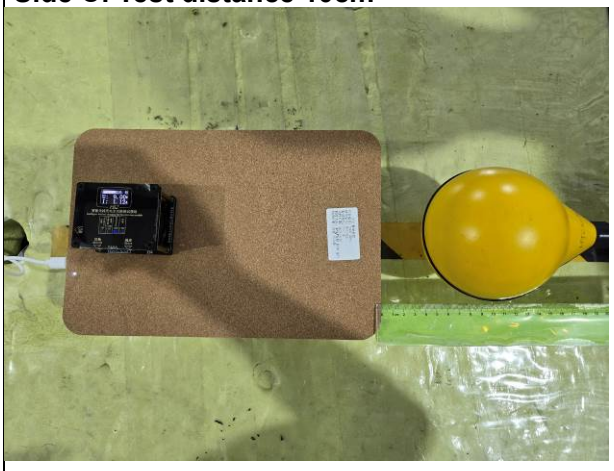
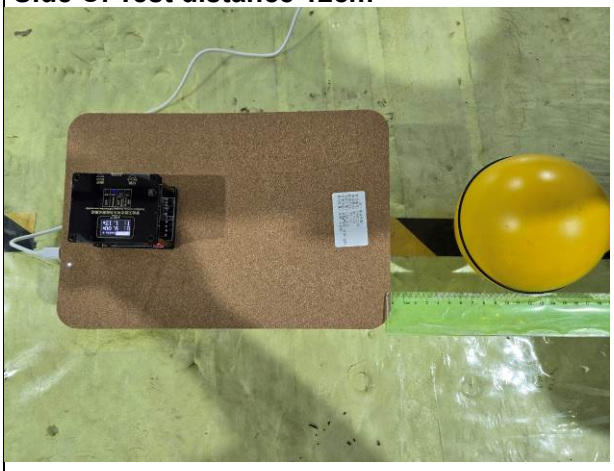
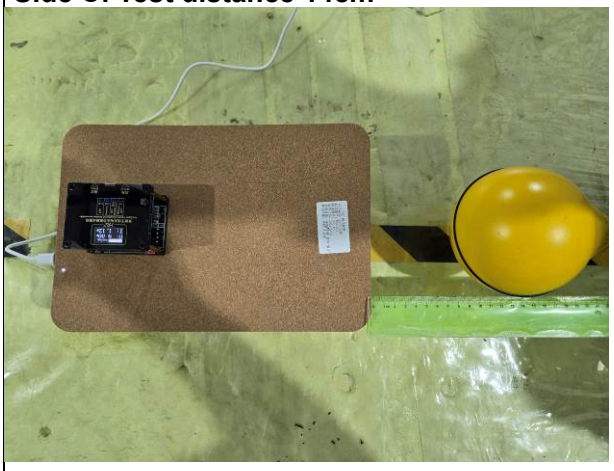


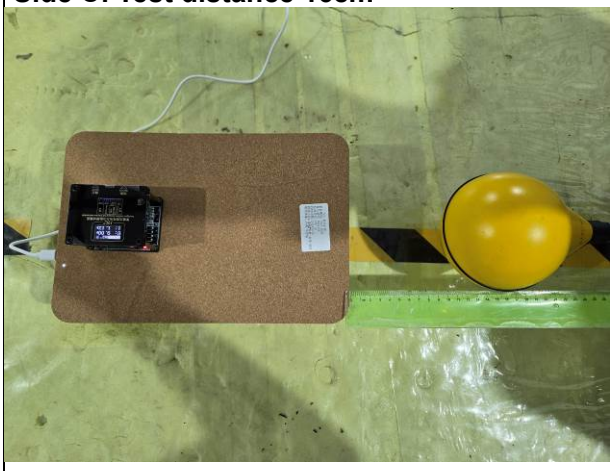
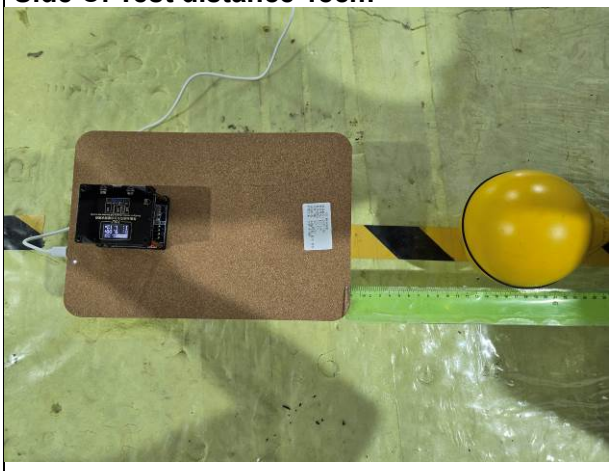
**Side B: Test distance 10cm**

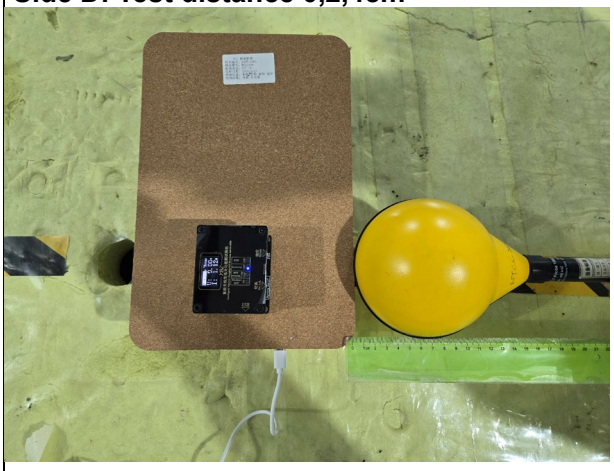
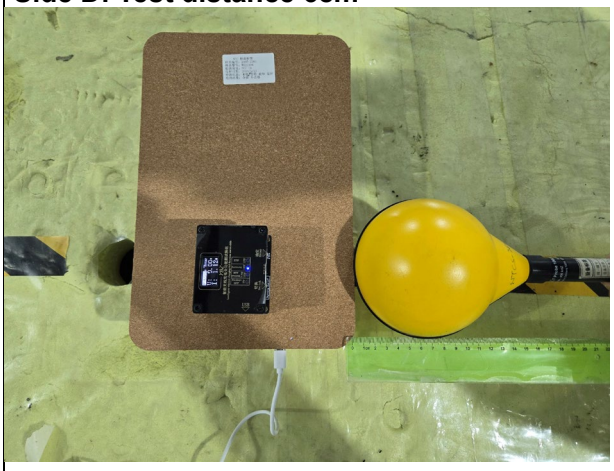
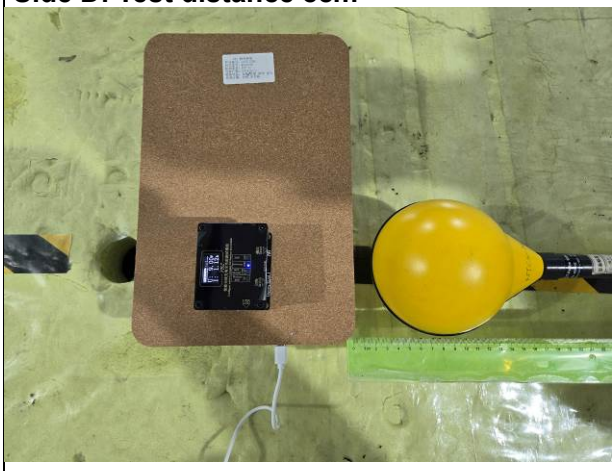
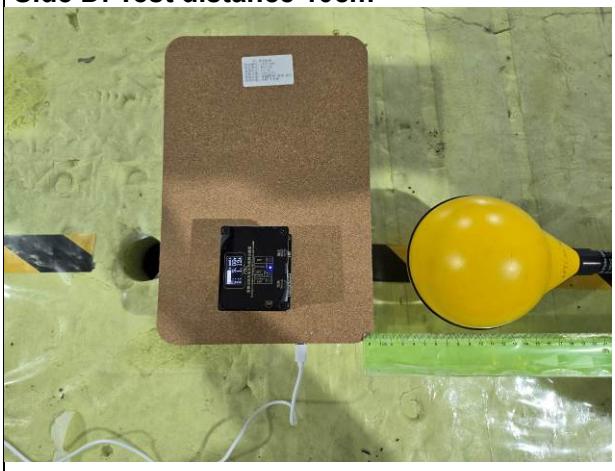
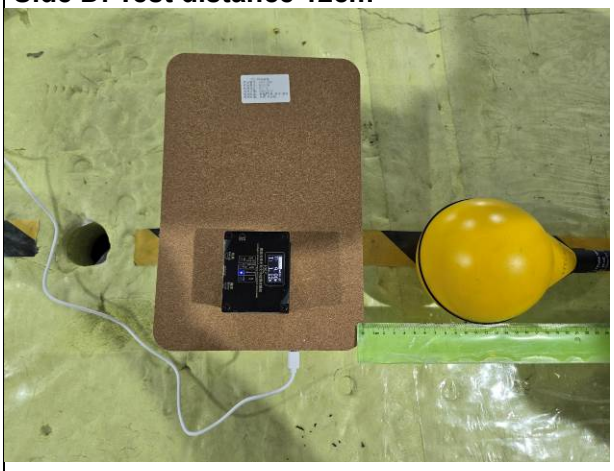
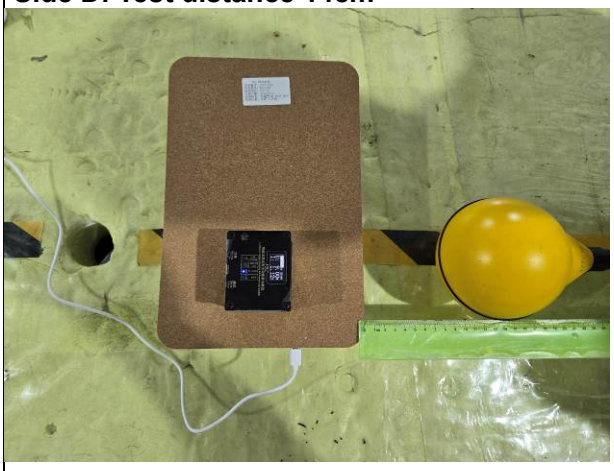
**Side B: Test distance 12cm**

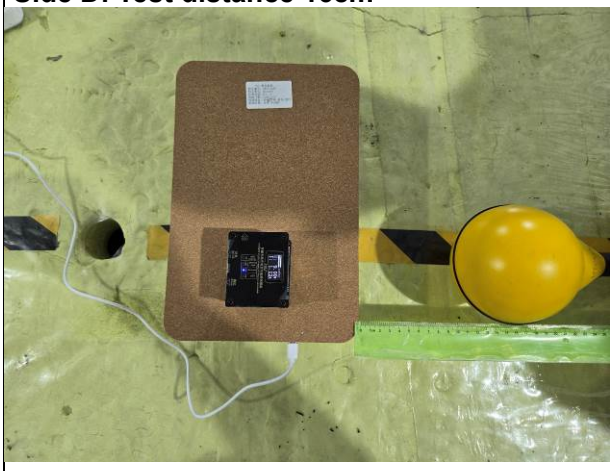
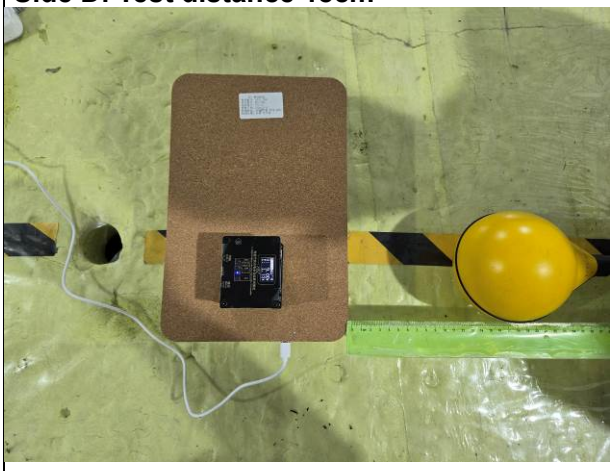
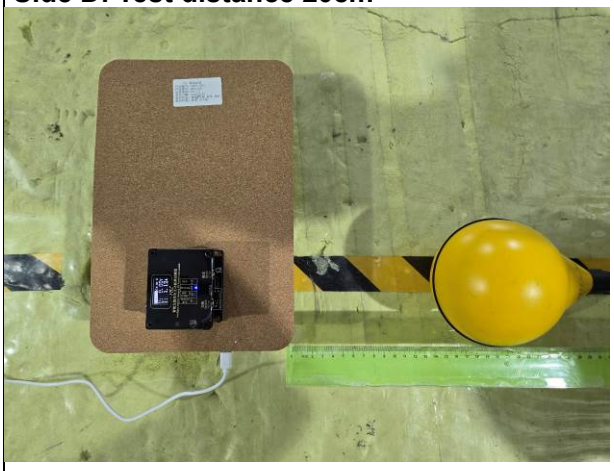
**Side B: Test distance 14cm**

| | |
|---|---|
| **Side B: Test distance 16cm**<br>  | **Side B: Test distance 18cm**<br>  |
| **Side B: Test distance 20cm**<br>  | |

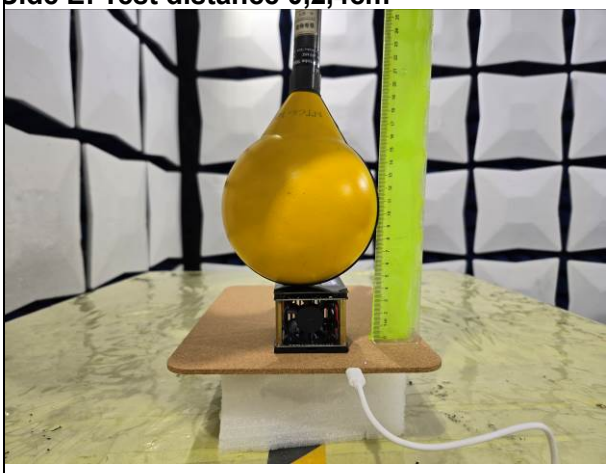
| | |
|---|---|
| **Side C: Test distance 0,2,4cm**<br>  | **Side C: Test distance 6cm**<br>  |
| **Side C: Test distance 8cm**<br>  | **Side C: Test distance 10cm**<br>  |
| **Side C: Test distance 12cm**<br>  | **Side C: Test distance 14cm**<br>  |

| | |
|---|---|
| **Side C: Test distance 16cm**<br>  | **Side C: Test distance 18cm**<br>  |
| **Side C: Test distance 20cm**<br>  | |

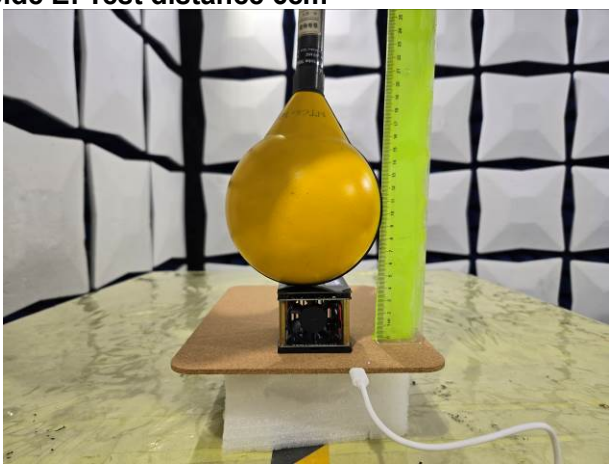
| | |
|---|---|
| **Side D: Test distance 0,2,4cm**<br>  | **Side D: Test distance 6cm**<br>  |
| **Side D: Test distance 8cm**<br>  | **Side D: Test distance 10cm**<br>  |
| **Side D: Test distance 12cm**<br>  | **Side D: Test distance 14cm**<br>  |

| | |
|---|---|
| **Side D: Test distance 16cm**<br>  | **Side D: Test distance 18cm**<br>  |
| **Side D: Test distance 20cm**<br>  | |

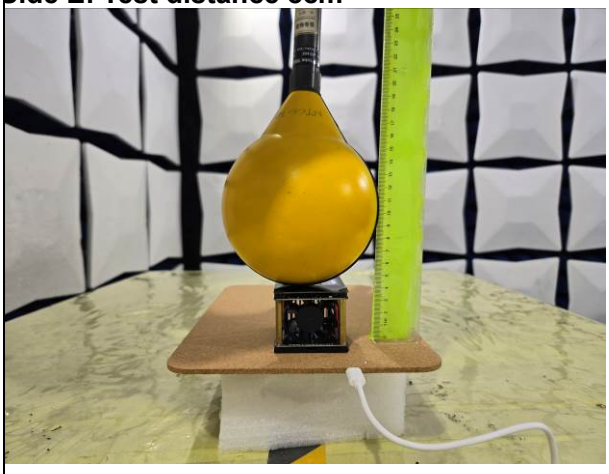
**Side E: Test distance 0,2,4cm**



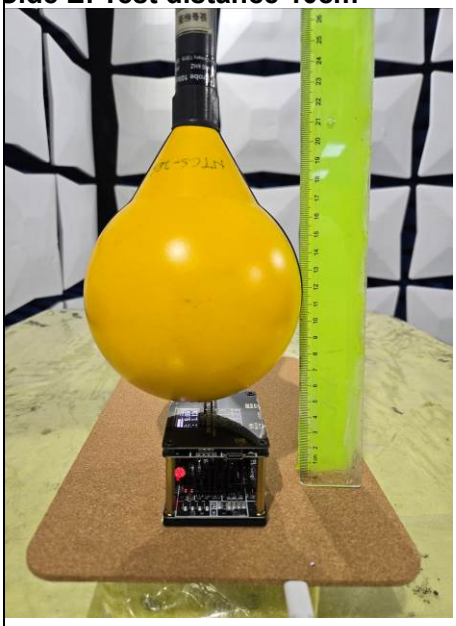
**Side E: Test distance 6cm**



**Side E: Test distance 8cm**

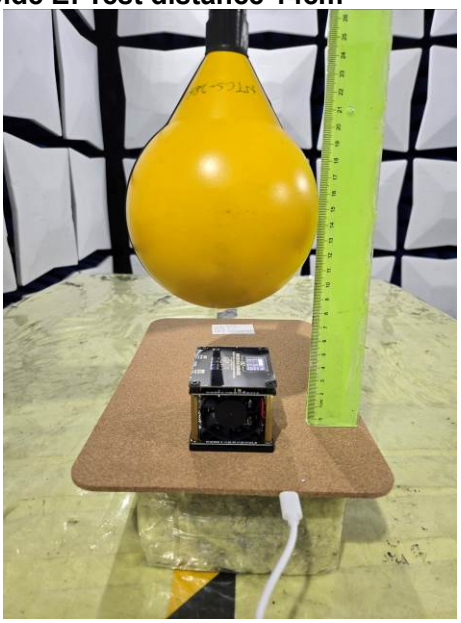


**Side E: Test distance 10cm**

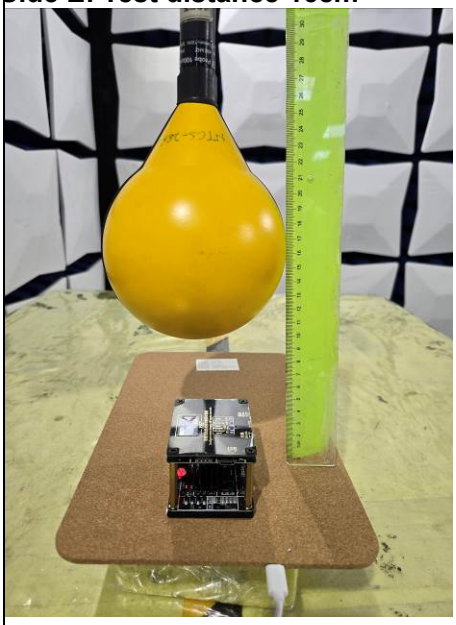


**Side E: Test distance 12cm**

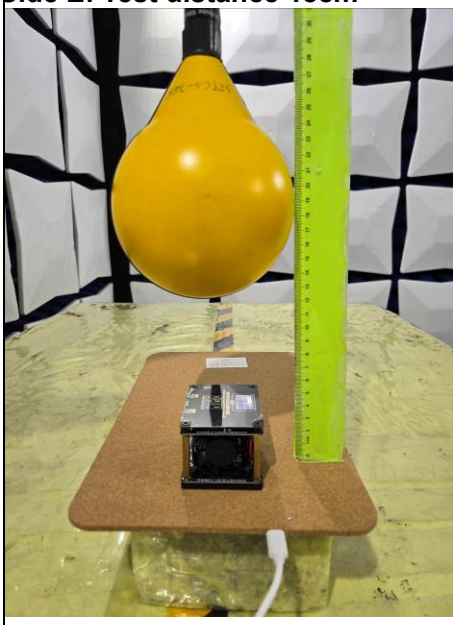
**Side E: Test distance 14cm**

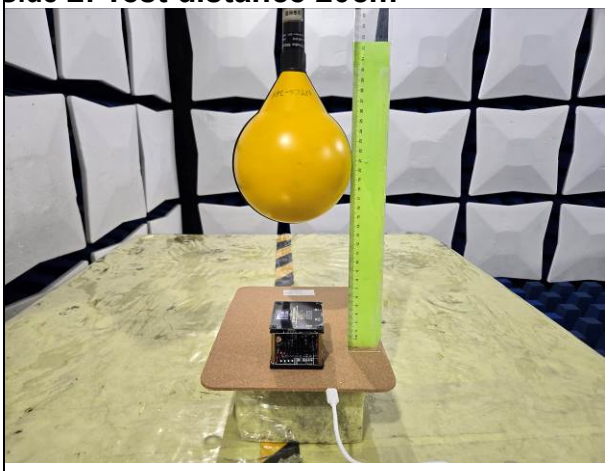


**Side E: Test distance 16cm**



**Side E: Test distance 18cm**

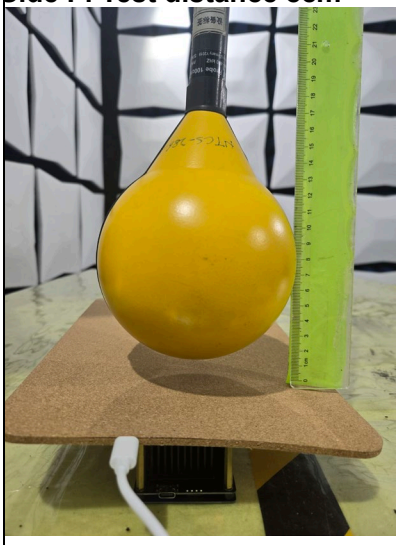


| | |
|---|---|
| **Side E: Test distance 20cm**<br>  | |

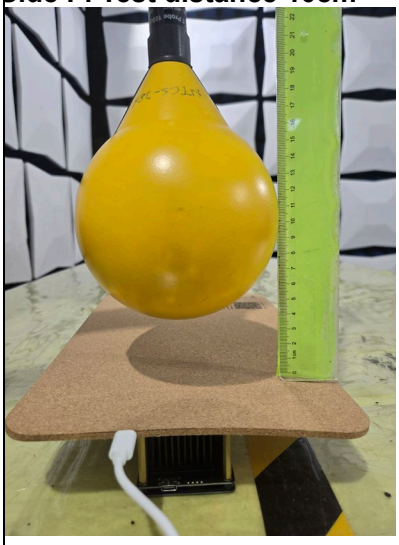
**Side F: Test distance 0,2,4cm**

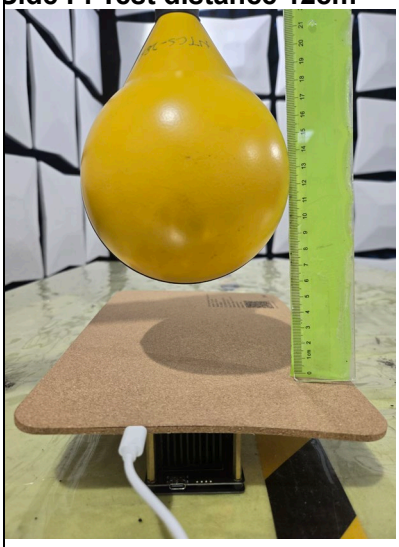
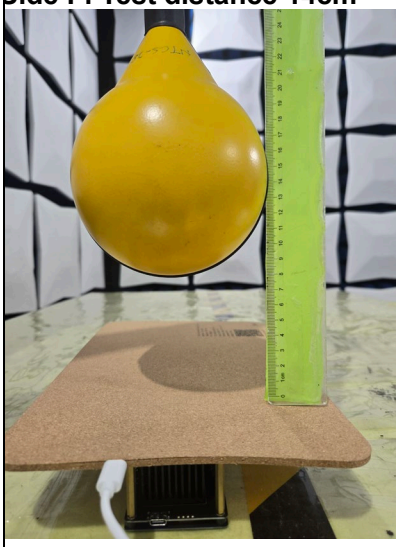
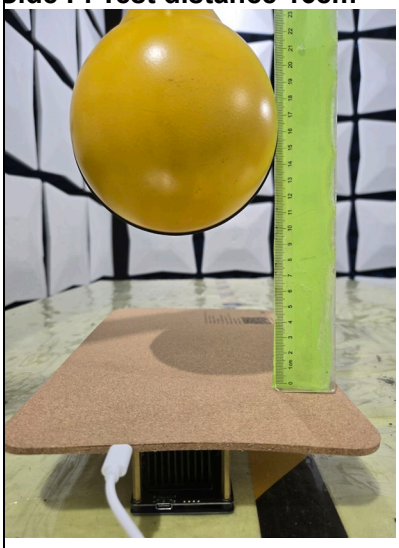
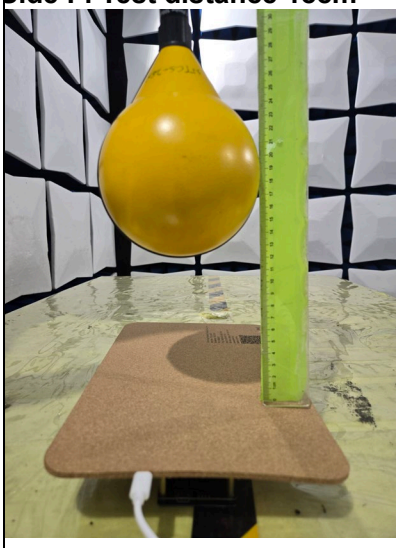
**Side F: Test distance 6cm**

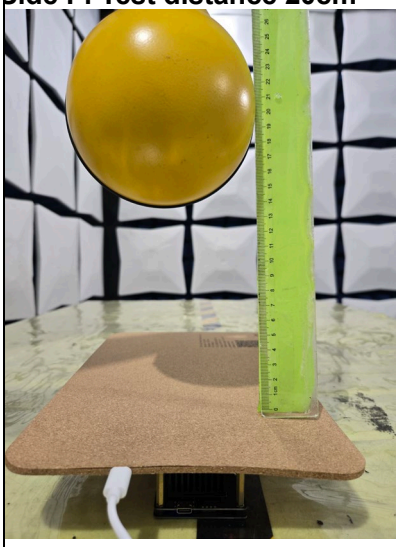
**Side F: Test distance 8cm**



**Side F: Test distance 10cm**



| | |
|---|---|
| **Side F: Test distance 12cm**<br>  | **Side F: Test distance 14cm**<br>  |
| **Side F: Test distance 16cm**<br>  | **Side F: Test distance 18cm**<br>  |

| | |
|---|---|
| **Side F: Test distance 20cm**<br>  | |

---End---