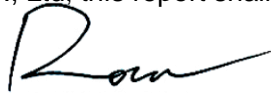


# RF EVALUATION TEST REPORT

Applicant..... : Raffel Systems, LLC  
Address..... : N112 W14600 Mequon Road, Germantown, Wisconsin, United States, 53022  
Manufacturer..... : FORTRESS ELECTRONICS (XIAMEN) CO., LTD.  
Address..... : East of the fifth floor, 181 banqiao road, jimei district, Xiamen, Fujian, China  
Factory..... : FORTRESS ELECTRONICS (XIAMEN) CO., LTD.  
Address..... : East of the fifth floor, 181 banqiao road, jimei district, Xiamen, Fujian, China  
Product Name..... : Embedded wireless charger  
Brand Name..... : Raffel Systems  
Model No. .... : WCP HBP 01-02, WCP BL 02  
(For additional model and model difference refer to section 2)  
FCC ID..... : YZHWCPXXX01  
Measurement Standard..... : 47 CFR PART 2, Section 2.1091  
Receipt Date of Samples.... : April 13, 2023  
Date of Tested..... : April 13, 2023 to April 26, 2023  
Date of Report..... : May 11, 2023

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

Rose Hu / Project Engineer



Approved by

Iori Fan / Authorized Signatory

## Table of Contents

1. General Description of EUT .....	4
2. Test Facility and Location .....	6
3. Test Modes Detail .....	7
4. Configuration of EUT .....	7
5. Modification of EUT .....	7
6. Description of Support Device.....	8
7. Deviations and Abnormalities from Standard Conditions .....	8
8. Applicable Standards and References.....	8
9. Equipment approval considerations.....	9
10. Measurement Uncertainty .....	9
11. Maximum Permissible Exposure.....	10
12. Test Equipment List.....	14
13. Test Photos .....	15

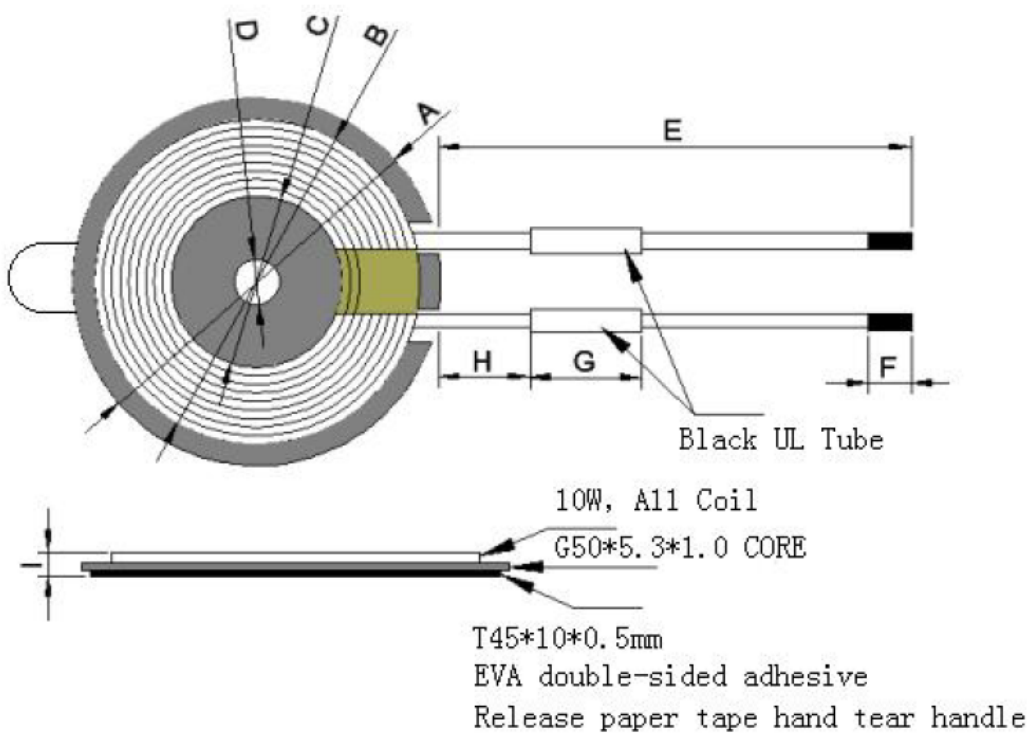


## 1. General Description of EUT

Product Information	
Product Name:	Embedded wireless charger
Main Model Name:	WCP HBP 01-02, WCP BL 02
Additional Model Name:	WCP XX 01, WCP XX 01-YY, WCP XX 02, WCP XX 02-YY (The XX in the middle represents the treatment of the shell, which is composed of two or three letters, the letters may be a-z, which are 26 letters. YY represents length of DC input line(0.1-1.8m)
Model Difference:	These models have the same circuit schematic, construction, PCB Layout and critical components. Their differences are size of shell, indicator light, the design of DC input Port, color, the length of DC input line and model number only due to trading purpose.
S/N:	2304-1891 for model WCP HBP 01-02; 2304-1892 for model WCP BL 02
Brand Name:	Raffel Systems
Hardware Version:	V01
Software Version:	V01
Rating:	Input DC 5V 2A, Output: 5W Max Input DC 9V 2A, Output: 10W Max
Typical Arrangement:	Table-top
I/O Port:	DC Port*1
Accessories Information	
Adapter:	N/A
Cable:	For model WCP HBP 01, DC Line: 1.22 unshielded, undetachable For model WCP HBP 02, DC Line: 0.19 unshielded, undetachable
Other:	N/A

Additional information	
Note:	According to the model difference, all tests were performed on model WCP HBP 01-02. This report only applies to wireless charging function.
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:	5W, 10W



A	49.5 ± 0.5
B	42.5 ± 1.0
C	20.5 ± 1.0
D	5.3 ± 0.2
E	72 ± 2
F	3.0 ± 1.0
G	15.0 ± 2.0
H	6 ± 1.0
I	2.9Max

## 2. Test Facility and Location

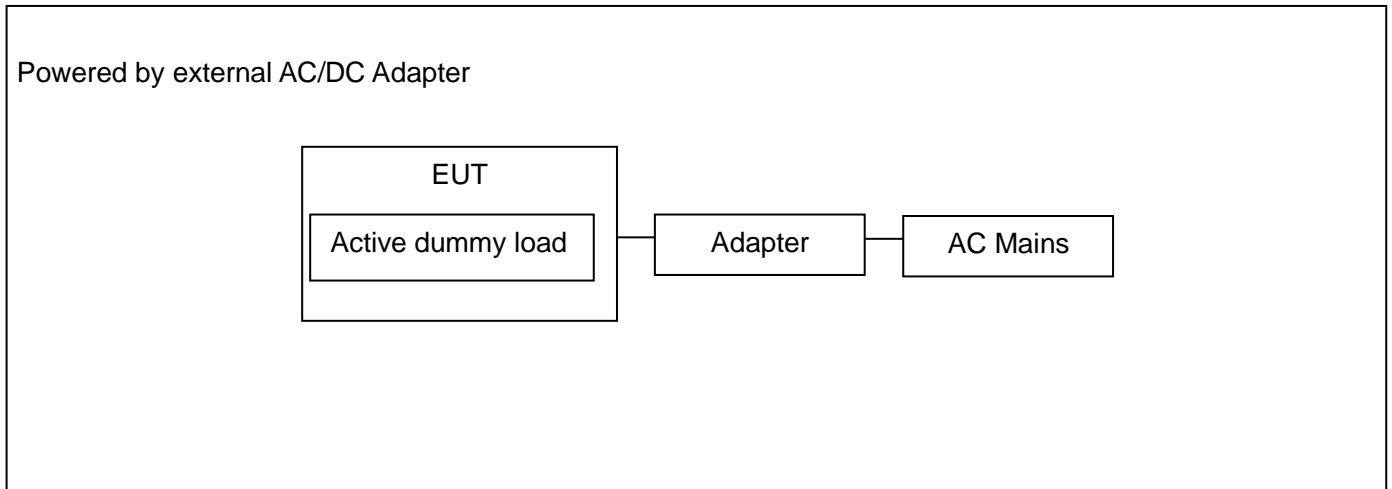
Test Site	:	Dongguan Nore Testing Center Co., Ltd. (Dongguan NTC Co., Ltd.)
Accreditations and Authorizations	:	<p>The Laboratory has been assessed and proved to be in compliance with CNAS/CL01</p> <p>Listed by CNAS, August 13, 2018</p> <p>The Certificate Registration Number is L5795.</p> <p>The Certificate is valid until August 13, 2024</p> <p>The Laboratory has been assessed and proved to be in compliance with ISO17025</p> <p>Listed by A2LA, November 01, 2017</p> <p>The Certificate Registration Number is 4429.01</p> <p>Listed by FCC, November 06, 2017</p> <p>Test Firm Registration Number: 907417</p> <p>Listed by Industry Canada, June 08, 2017</p> <p>The Certificate Registration Number. Is 46405-9743A</p>
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 (10W)	Full Load, Half Load, Empty Load

Note: For all of the test mode, only the worst case was recorded in this report.

### 4. Configuration of EUT



### 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	---	---	---	---	Provided by manufacturer
2.	Adapter	HUAWEI	HW-05020 0C01	---	---	Provided by manufacturer

## 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 D01v03



## 9. Equipment approval considerations

No.	Requirements	Conditions of the EUT
1.	Power transfer frequency is less than 1MHz	Yes, the operated frequency range is 110.5-205KHz.
2.	Output power from each primary coil is less than or equal to 15 watts	Yes, the maximum output power of the primary coil is 10W
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	Yes; the transfer system includes one source primary coil pairs that can be powered on at the same time.
4.	Client device is placed directly in contact with the transmitter.	Yes, Client device is placed directly in contact with the transmitter.
5.	Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).	Yes. The device can be used as mobile exposure condition.
6.	The aggregate H-field strengths at 20cm surrounding the device from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.	Yes, less than the limits.
Remark: <input type="checkbox"/> need PAG process <input checked="" type="checkbox"/> no need PAG process		

## 10. Measurement Uncertainty

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

## 11. Maximum Permissible Exposure

### LIMIT

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

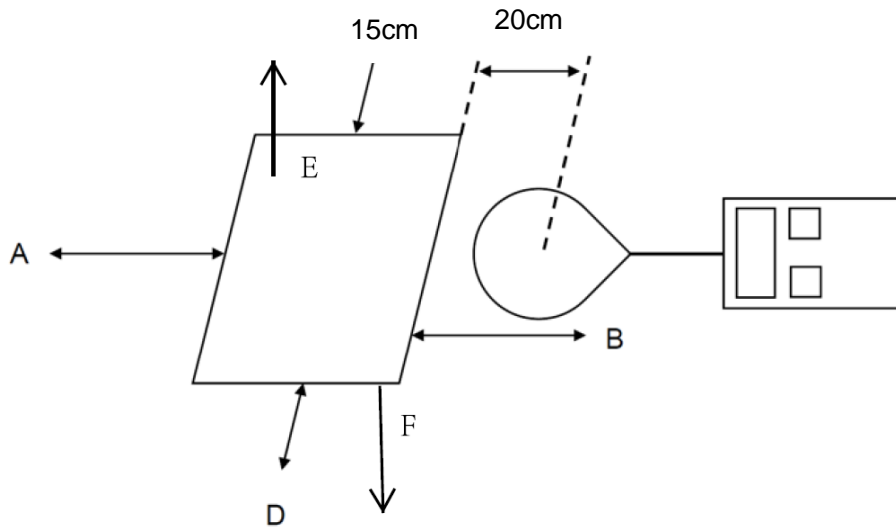
\*=Plane-wave equivalent power density

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 v03 r01, RF exposure evaluation at 15cm 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.

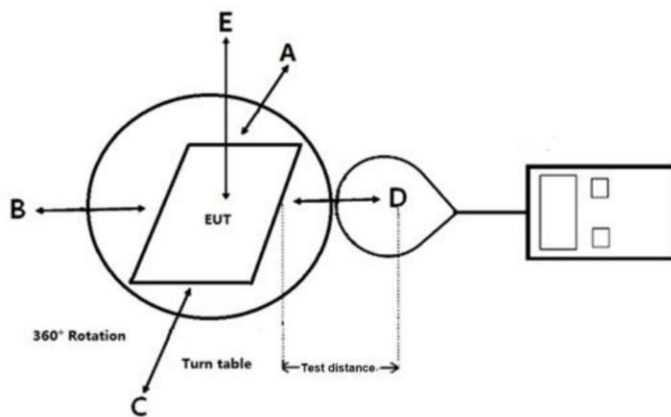
**BLOCK DIAGRAM OF TEST SETUP**

**For Mobile:**



Note: The distance of the points A/B/C/D is 15cm, and the point E is 20cm.

**For Portable:**



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

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## 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 15cm surrounding the EUT and 20cm above the top surface of the primary/client pair.
- c. The highest emission level was recorded and compared with limit.
- d. The EUT was measured according to the dictates of KDB 680106 v03r01.

For portable exposure conditions:

- a. The RF exposure test was performed in anechoic chamber;
- b. E and H-field measurements should be made with the probe at 0cm for all side of the EUT.
- c. The highest emission level was recorded and compared with limit.

For portable exposure conditions:

Perform H-field measurements for each edge/top surface of the host/client pair at every 2cm, starting from as close as possible out to 10cm.

## TEST RESULTS

PASS

Please refer to the following pages of the worst case (10W wireless charging & powered by external AC/DC Adapter).

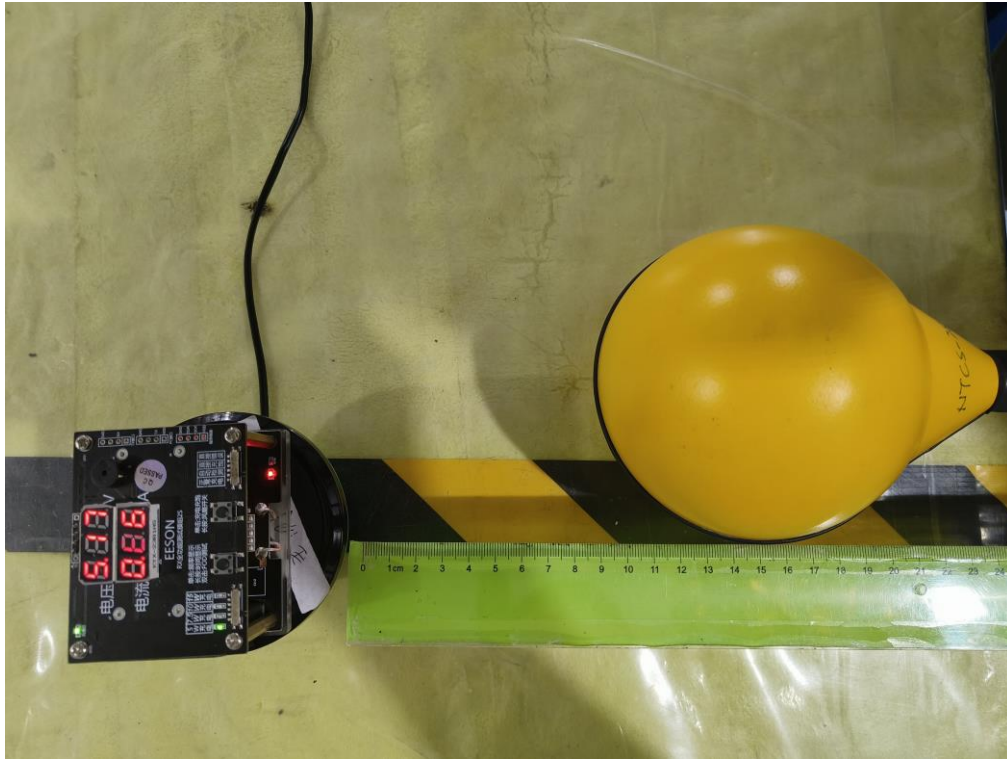
Full Load, Test Mode 2					
Test Distance (cm)	Test Position	Mobile Measure Result (V/m)	Mobile Measure Result (A/m)	Limit (V/m)	Limit (A/m)
15	Side A	3.40	0.28	614	0.815
	Side B	2.68	0.29	614	0.815
	Side C	2.94	0.35	614	0.815
	Side D	3.26	0.31	614	0.815
	Side E	---	---	---	---
20	Side A	---	---	---	---
	Side B	---	---	---	---
	Side C	---	---	---	---
	Side D	---	---	---	---
	Side E	3.71	0.38	614	0.815

## 12. Test Equipment List

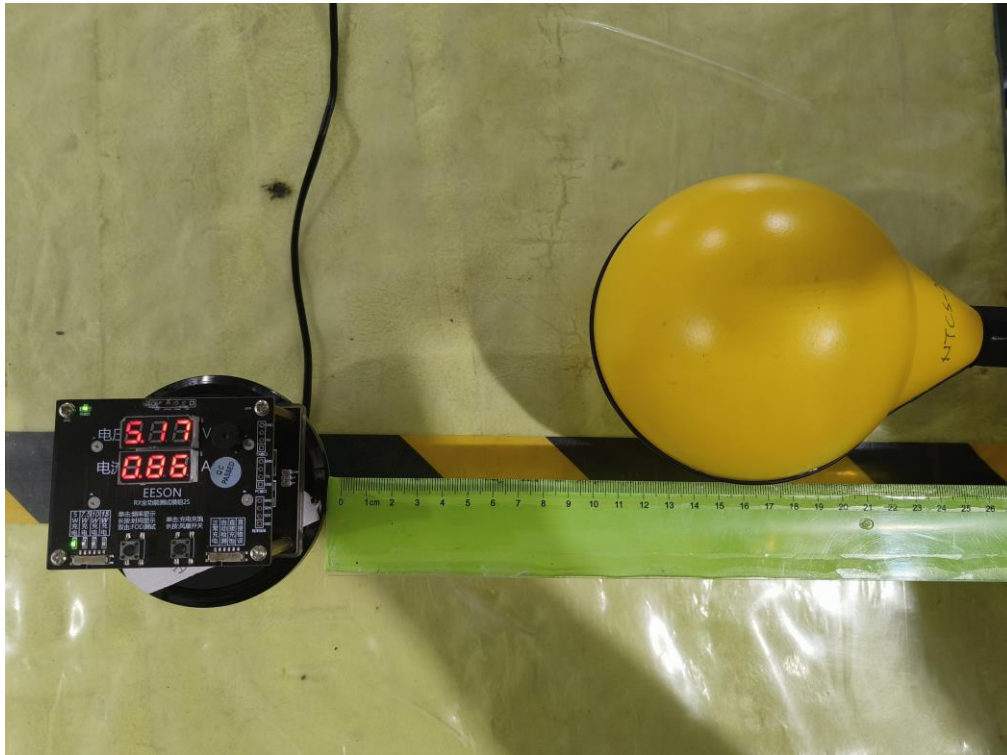
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Magnetic field probe 100cm <sup>2</sup>	Narda	ETL-400 Probe 1Hz-400KHz (r=6.2cm)	O-0167	June 28,2022	1 Year
2.	E-Field Probe	Narda	EP-601	611WX70729	Mar. 23, 2023	1 Year

### 13. Test Photos

Side A: Test distance 15cm

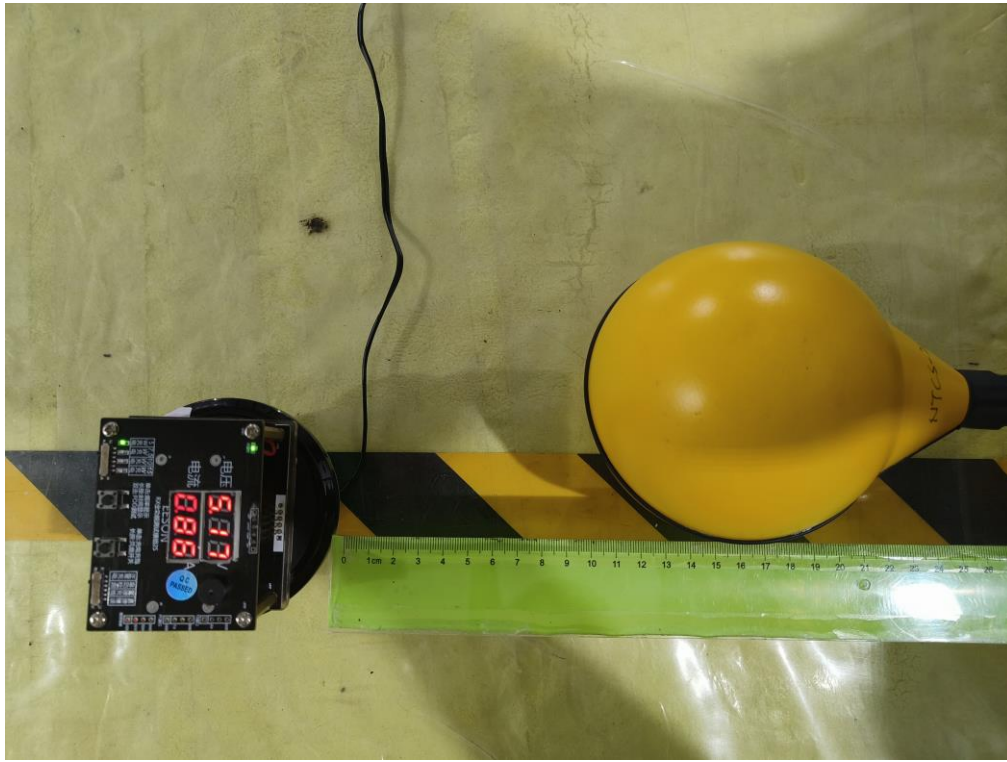


Side B: Test distance 15cm

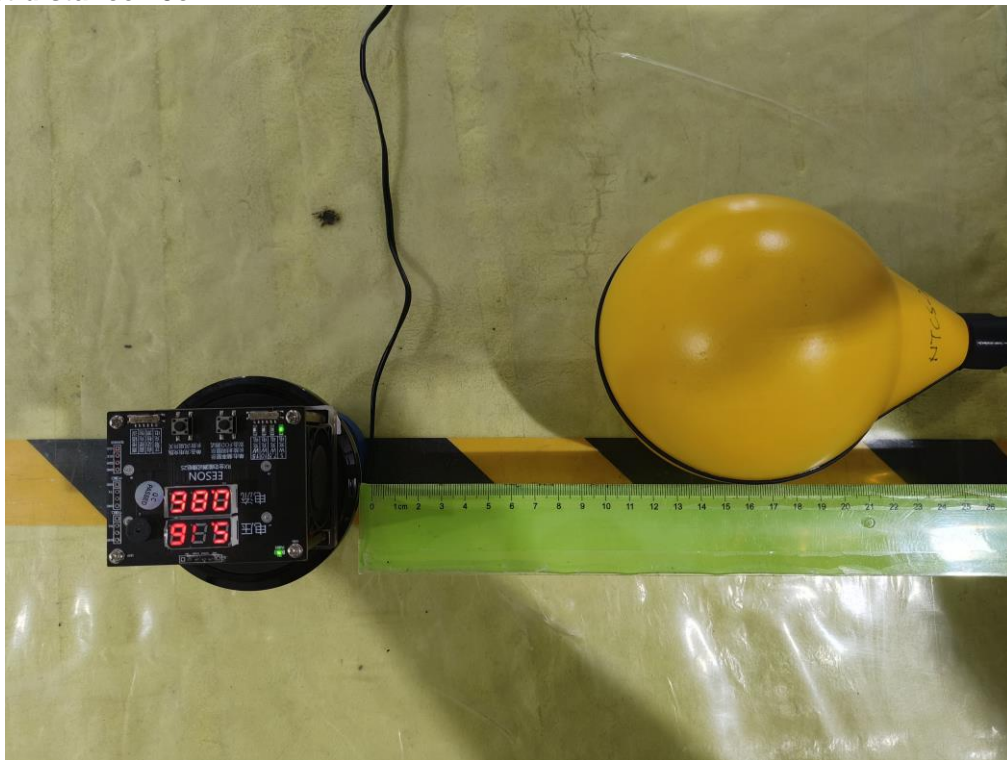




**Side C: Test distance 15cm**

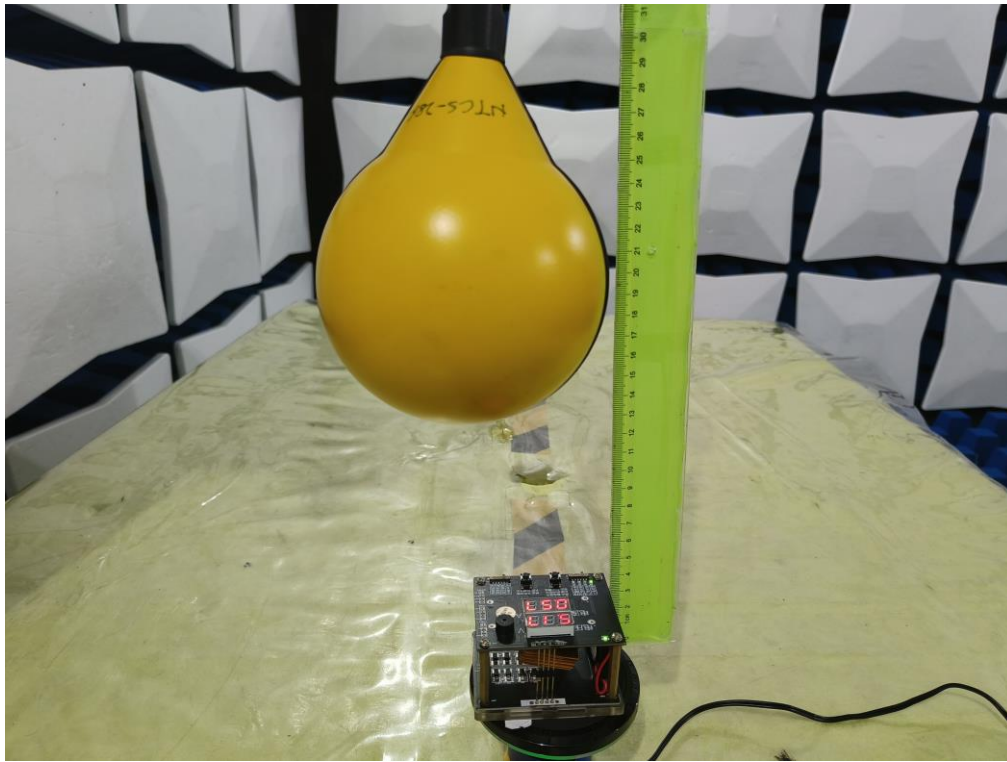


**Side D: Test distance 15cm**





**Side E: Test distance 20cm**



---End---