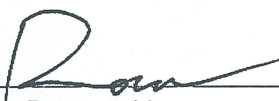


# RF EVALUATION TEST REPORT

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..... : Wireless charging tray  
Brand Name..... : Raffel Systems  
Model No. .... : WCT BR 04 (For additional model and model difference refer to section 2)  
FCC ID..... : YZHWCTXX04  
Measurement Standard..... : 47 CFR PART 2, Section 2.1091& 2.1093  
Receipt Date of Samples.... : December 29, 2022  
Date of Tested..... : December 29, 2022 to January 15, 2023  
Date of Report..... : February 02, 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

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## 1. General Description of EUT

Product Information	
Product Name:	Wireless charging tray
Main Model Name:	WCT BR 04
Additional Model Name:	WCT XX 04(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.), WCT BA 04, WCT BL 04, WCT BC 04, WCT BP 04, WCT SL 04, WCT PBC 04, WCT HBP 04, WCT GDP 04
Model Difference:	These models have the same circuit schematic, construction, PCB Layout and critical components. Their differences are color and model number only due to trading purpose.
S/N:	2212-7110
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:	DC Line: 0.32m unshielded, undetachable
Other:	N/A
Additional information	
Note:	According to the model difference, all tests were performed on model WCT BR 04.  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

Model details:

Model number	Surface finish
WCT BA 04	BRUSHED ALUMINUM
WCT BL 04	BLACK PLASTIC
WCT BR 04	BLACK RUBBER
WCT BC 04	BLACK CHROME
WCT BP 04	BLACK PAINT
WCT SL 04	SILVER PAINT
WCT PBC 04	PEARL BLACK CHROME
WCT HBP 04	High Gloss Black Paint
WCT GDP 04	GOLD PAINT

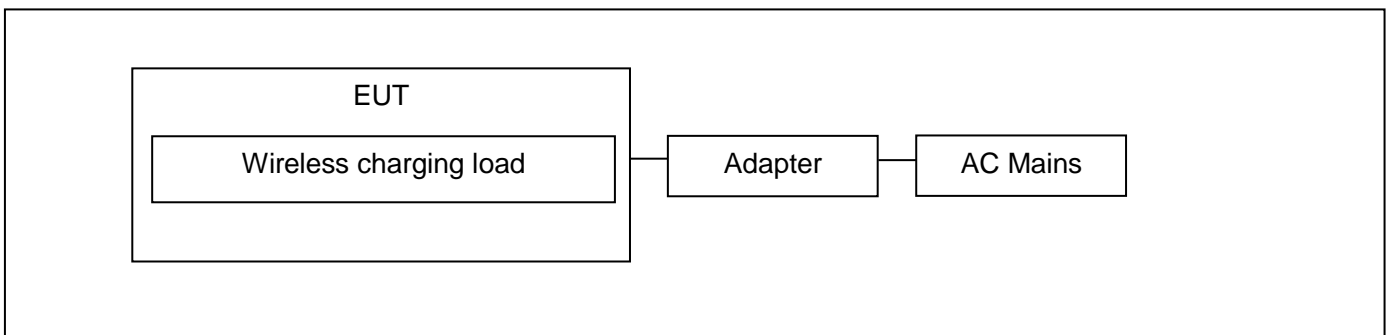
## 2. Test Facility and Location

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 Listed by CNAS, August 13, 2018 The Certificate Registration Number is L5795. The Certificate is valid until August 13, 2024</p> <p>The Laboratory has been assessed and proved to be in compliance with ISO17025 Listed by A2LA, November 01, 2017 The Certificate Registration Number is 4429.01</p> <p>Listed by FCC, November 06, 2017 Test Firm Registration Number: 907417</p> <p>Listed by Industry Canada, June 08, 2017 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

Mode		Modulation
1	1 wireless charging (5W)	FSK
2	1 wireless charging (10W)	

### 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	HUWEI	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

TCB Workshop October 2021



## 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 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
4.	Client device is placed directly in contact with the transmitter.	Yes
5.	Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).	Yes
6.	The aggregate H-field strengths at 15cm surrounding the device and 20cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.	Yes
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> 1. 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

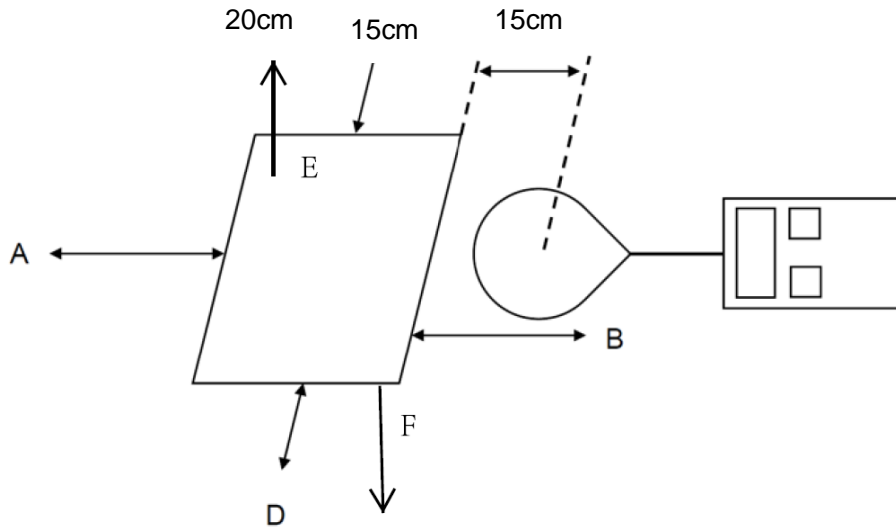
\*=Plane-wave equivalent power density

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.

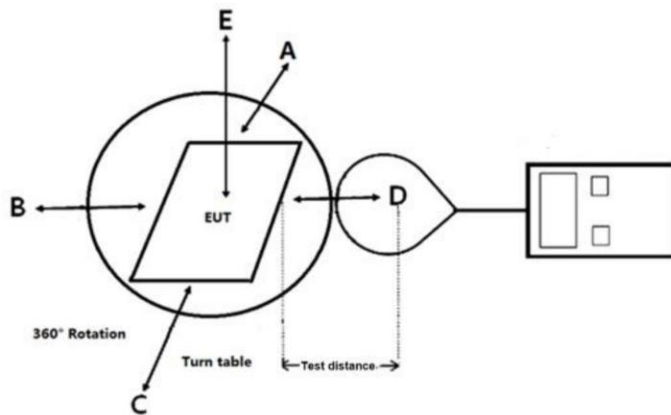
**BLOCK DIAGRAM OF TEST SETUP**

**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

- a. The EUT was placed on a non-conductive table top of shielding room or anechoic chamber, and the ancillary equipment (e.g., mobile phone, dummy loads) was placed on the EUT for charging.
- b. Maximum E-field and H-field measurements were tested 2/4/6/8/10/12/14/16/18/20cm (portable device) or 15/20cm (mobile device) from each side of the EUT.
- c. Along the side of the EUT to center of E-field probe and H-field probe were positioned at the location to search maximum field strength and record the results.
- d. Repeat the steps a~c on each test modes and configurations until the end of the test.

## TEST RESULTS

PASS

Test by empty load, half load and full load mode , List only the worst case

Please refer to the following pages of the worst case: Full Load.

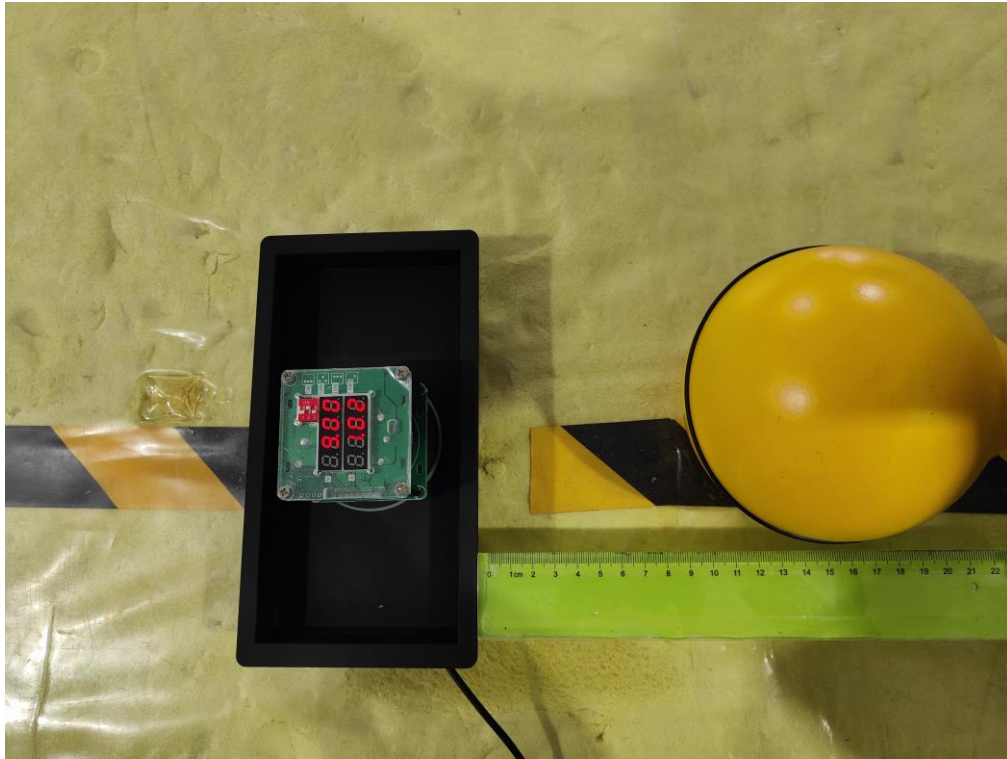
Full Load, Test Mode 2					
Test Distance (cm)	Test Position	Mobile Measure Result (V/m)	Mobile Measure Result (A/m)	Limit (V/m)	Limit (A/m)
15	Side A	0.44	0.46	614	0.815
	Side B	0.46	0.44	614	0.815
	Side C	0.44	0.43	614	0.815
	Side D	0.45	0.43	614	0.815
	Side E	---	---	---	---
20	Side A	---	---	---	---
	Side B	---	---	---	---
	Side C	---	---	---	---
	Side D	---	---	---	---
	Side E	0.51	0.48	614	0.815

## 12. Test Equipment List

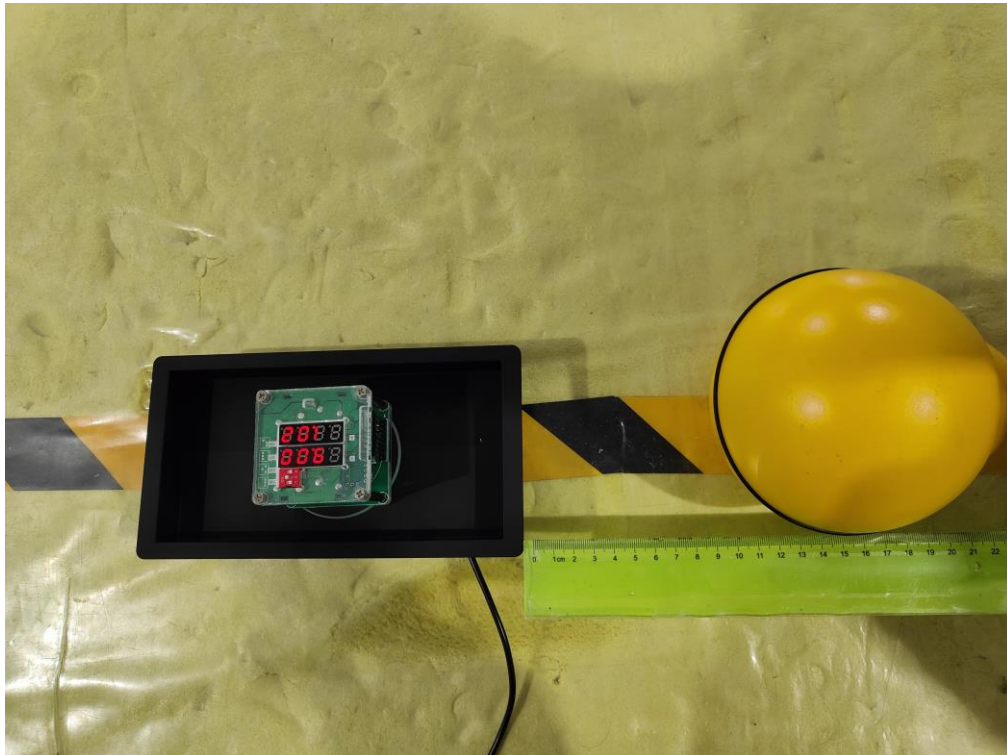
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Magnetic field probe 100cm2	Narda	ETL Probe 1Hz-400KHz	M-1587	Mar. 23, 2022	1 Year
2.	E-Field Probe	Narda	EP-601	611WX70729	Mar. 23, 2022	1 Year

### 13. Test Photos

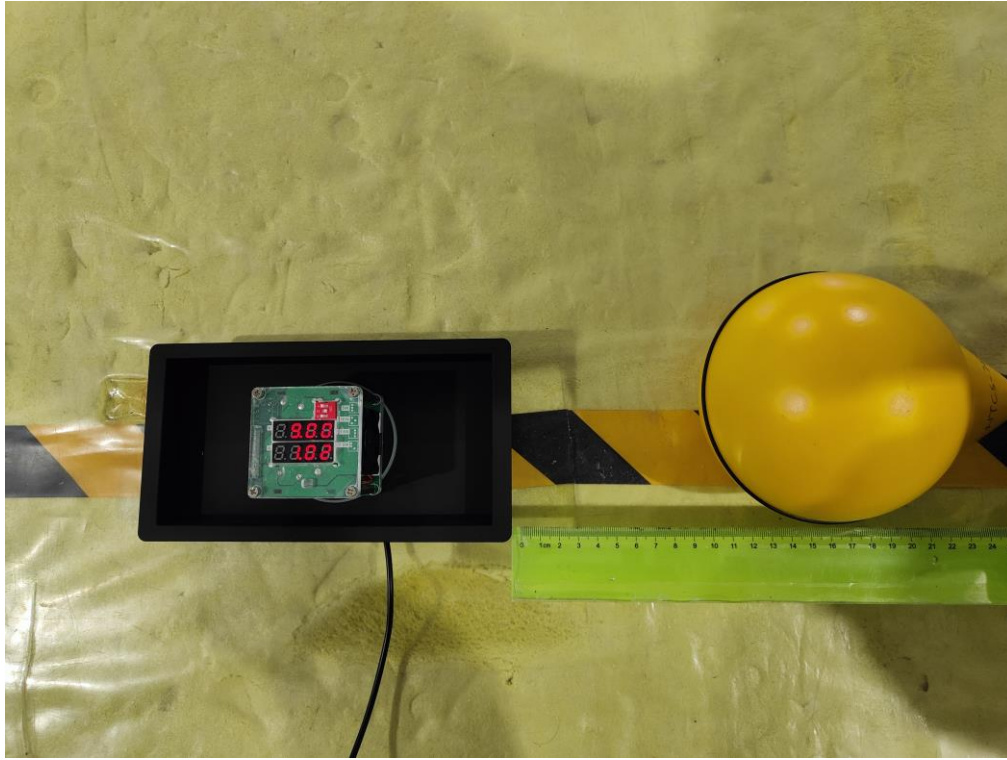
Side A: Test distance 15cm



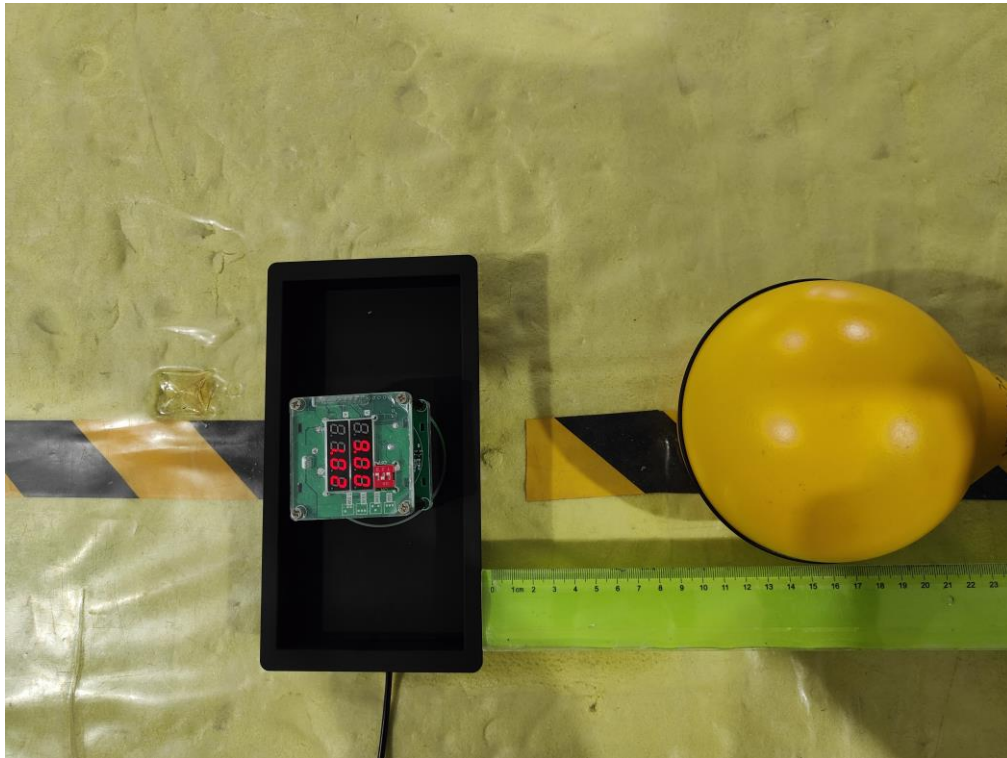
Side B: Test distance 15cm



**Side C: Test distance 15cm**

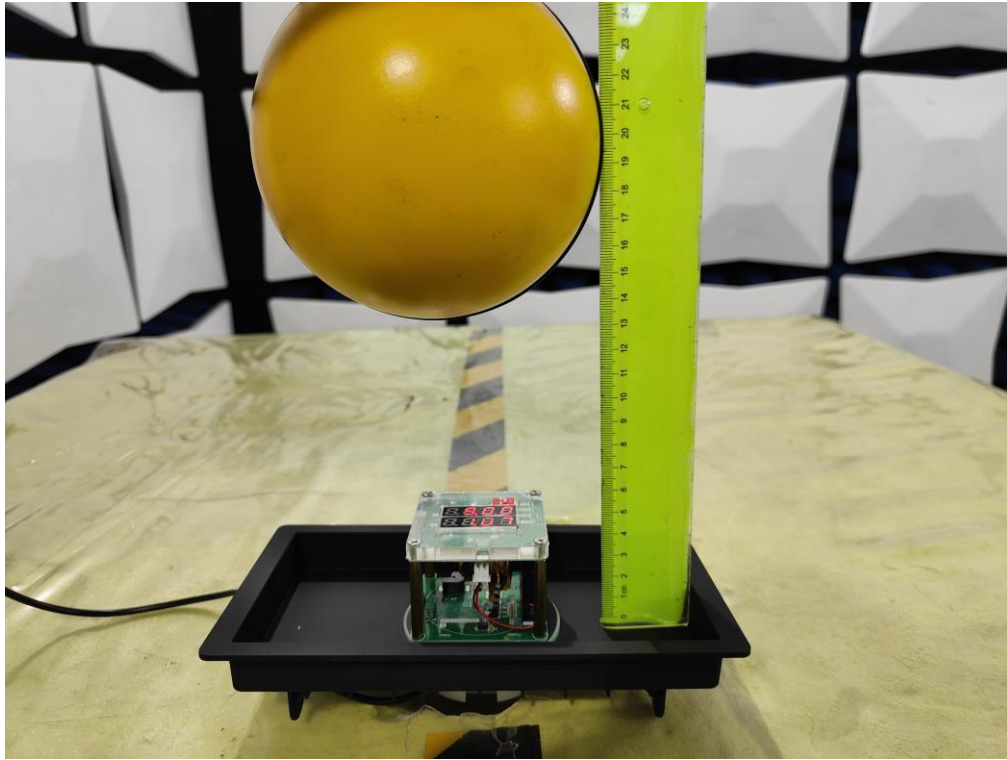


**Side D: Test distance 15cm**





**Side E: Test distance 20cm**



---End---