

# RF EVALUATION TEST REPORT

Applicant..... : Hysolis LLC

Address..... : 350 Pauma Place Escondido CA 92029 USA

Manufacturer..... : Seasun New Energy Co., Ltd.

Address..... : No. 215 Jincheng Rd Jintan Changzhou Jiangsu PRC 213200

Factory..... : Foshan SNAT Energy Electrical Technology Co.,Ltd.

Address..... : Unit 101-501, Building 27, Wan Yang, Chuangzhi Park, No. 82, Wuxing section, Xiaotang Industrial Avenue, Nanhai District, Foshan, Guangdong

Product Name..... : Power Station

Brand Name..... : N/A

Model No. .... : Apollo 5K

FCC ID..... : 2BDZ4-APL2401

Measurement Standard..... : 47 CFR PART 2, Section 2.1091

Receipt Date of Samples.... : November 28, 2023

Date of Tested..... : December 06, 2023 to January 22, 2024

Date of Report..... : February 01, 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

Julie Xiao / Project Engineer



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## Revision History

## 1. General Description of EUT

Product Information	
Product Name:	Power Station
Main Model Name:	Apollo 5K
Additional Model Name:	N/A
Model Difference:	N/A
S/N:	2311-5977
Brand Name:	N/A
Hardware Version:	V1.0
Software Version:	V1.0
Rating:	AC output: AC 120V, 60Hz (Max. 25A, 3000W) DC output: DC 12V/10A*1, DC 12V/30A*1, DC 12V/2A*2 2*USB output: QC 3.0 5V/9V/12V (Max. 18W) Type-C output: 5V/9V/12V PD 18W Type-C output: 5V/9V/12V/15V/20V PD 100W Solar input: DC 60-500V AC input: AC 120V, 60Hz (Max. 30A) DC input: 12V/24V (Max. 10A) Capacity: DC 51.2V 105Ah, 5376Wh Wireless charging: 5W, 7.5W, 10W, 15WS
Typical Arrangement:	Floor-standing
I/O Port:	Refer to user manual
Accessories Information	
Adapter:	N/A
Cable:	USB cable: 0.26m, 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:	5W, 7.5W, 10W, 15W

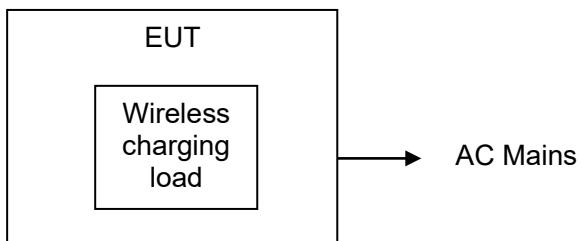
## 2. Test Facility and Location

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 7.5W	Full Load, Half Load, Empty Load
3.	Wireless Charging 10W	Full Load, Half Load, Empty Load
4.	Wireless Charging 15W	Full Load, Half Load, Empty Load

### 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	Consumer Electronics	2S	---	---	Provided by the Lab.
2.	PV power source	ACTIONPOWER	PRD1506	---	---	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.	The power transfer frequency is below 1 MHz.	Yes, the operated frequency range is 110.5-205KHz.
2.	The output power from each transmitting element (e.g., coil) is less than or equal to 15 watts.	Yes, the maximum output power of the primary coil is 15W
3.	A client device providing the maximum permitted load is placed in physical contact with the transmitter (i.e., the surfaces of the transmitter and client device enclosures need to be in physical contact)	Yes, Client device is placed directly in contact with the transmitter.
4.	Only § 2.1091-Mobile exposure conditions apply (i.e., this provision does not cover § 2.1093-Portable exposure conditions).	Yes. The device can be used as mobile exposure condition.
5.	The E-field and H-field strengths, at and beyond 20 cm surrounding the device surface, are demonstrated to be less than 50% of the applicable MPE limit, per KDB 447498, Table 1. These measurements shall be taken along the principal axes of the device, with one axis oriented along the direction of the estimated maximum field strength, and for three points per axis or until a $1/d$ (inverse distance from the emitter structure) field strength decay is observed. Symmetry considerations may be used for test reduction purposes. The device shall be operated in documented worst-case compliance scenarios (i.e., the ones that lead to the maximum field components), and while all the radiating structures (e.g., coils or antennas) that by design can simultaneously transmit are energized at their nominal maximum power.	Yes, less than the limits.
6.	For systems with more than one radiating structure, the conditions specified in (5) must be met when the system is fully loaded (i.e., clients absorbing maximum power available), and with all the radiating structures operating at maximum power at the same time, as per design conditions. If the design allows one or more radiating structures to be powered at a higher level while other radiating structures are not powered, then those cases must be tested as well. For instance, a device may use three RF coils powered at 5 W, or one coil powered at 15 W: in this case, both scenarios shall be tested.	The drive has one coil powered at 15W

## 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. 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

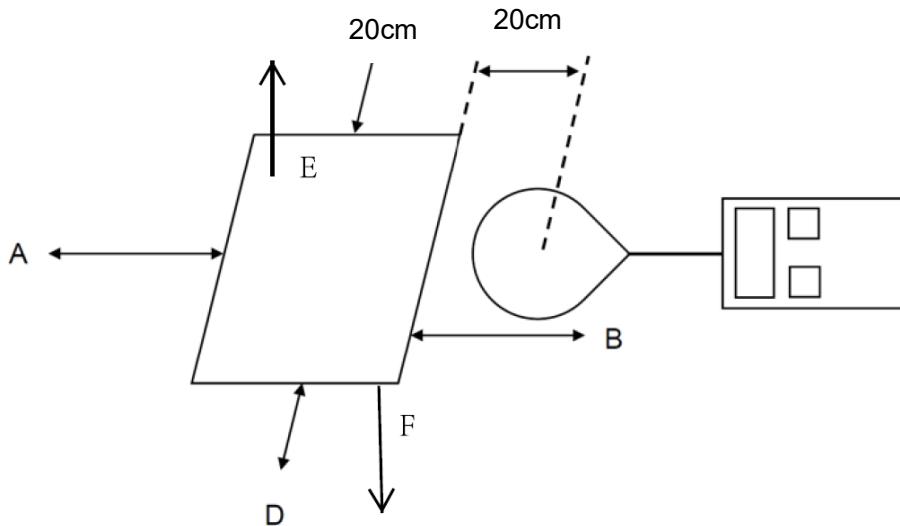
\*=Plane-wave equivalent power density

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 D01v04, RF exposure evaluation at 20cm surrounding the device 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.

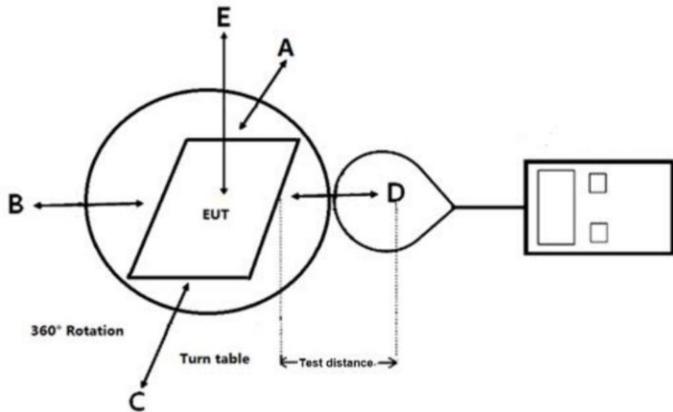
## BLOCK DIAGRAM OF TEST SETUP

### 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 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 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 D01v04. 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 20cm.

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## TEST RESULTS

PASS

Please refer to the following pages of the worst case.

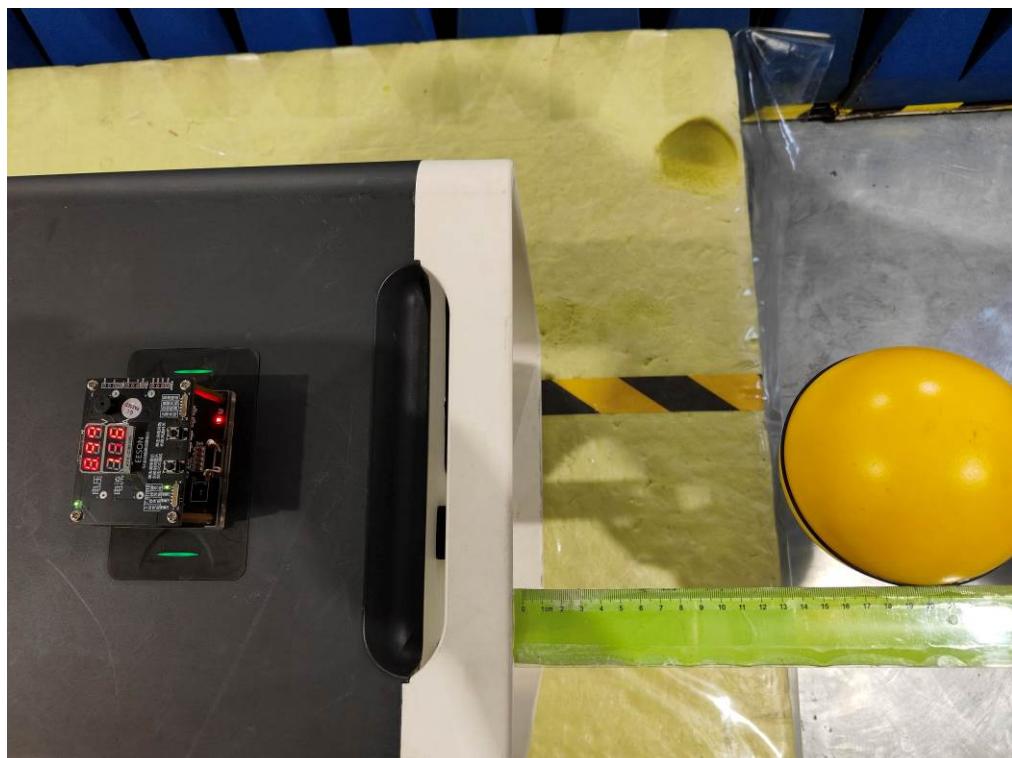
15W, Test Mode 4							
Test Distance (cm)	Test Position	Mobile Measure Result (V/m)	Mobile Measure Result (A/m)	Limit (V/m)	50% Limit (V/m)	Limit (A/m)	50% Limit (A/m)
20	Side A	3.189	0.18	614	307	1.63	0.815
	Side B	2.549	0.18	614	307	1.63	0.815
	Side C	3.696	0.18	614	307	1.63	0.815
	Side D	2.974	0.18	614	307	1.63	0.815
	Side E	6.552	0.22	614	307	1.63	0.815

## 12. Test Equipment List

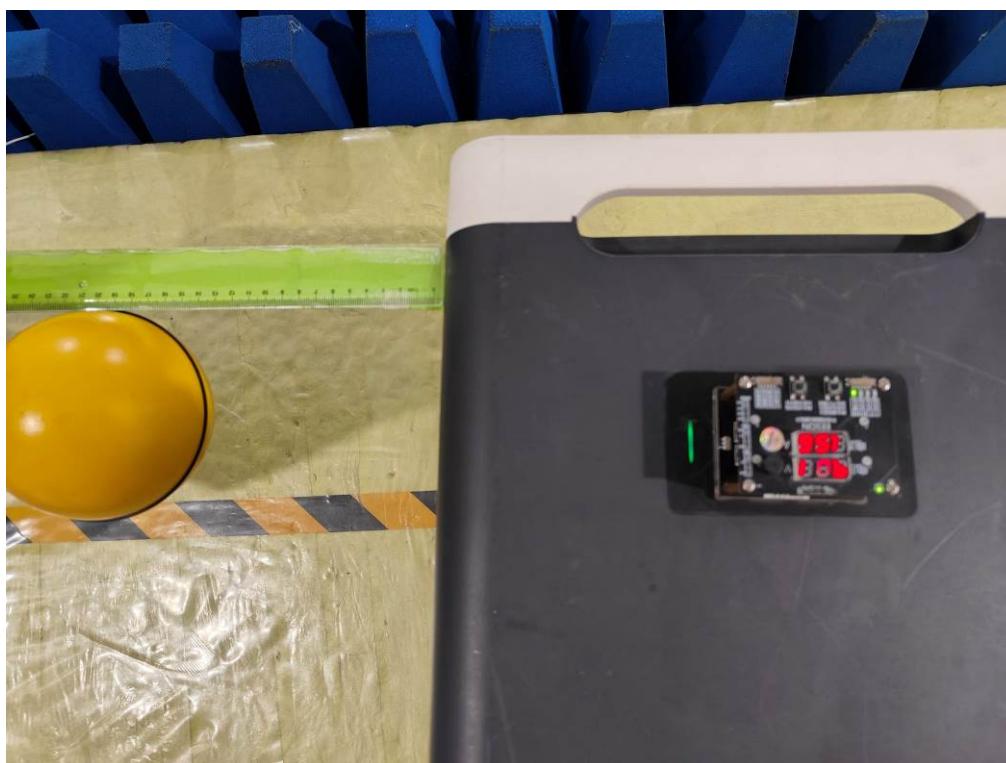
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Magnetic field probe 100cm <sup>2</sup>	Narda	ETL-400 Probe 1Hz-400KHz (r=6.2cm)	O-0167	June 28,2023	1 Year
2.	E-Field Probe	Narda	EP-601	611WX70729	Mar. 23, 2023	1 Year

## 13. Test Photos

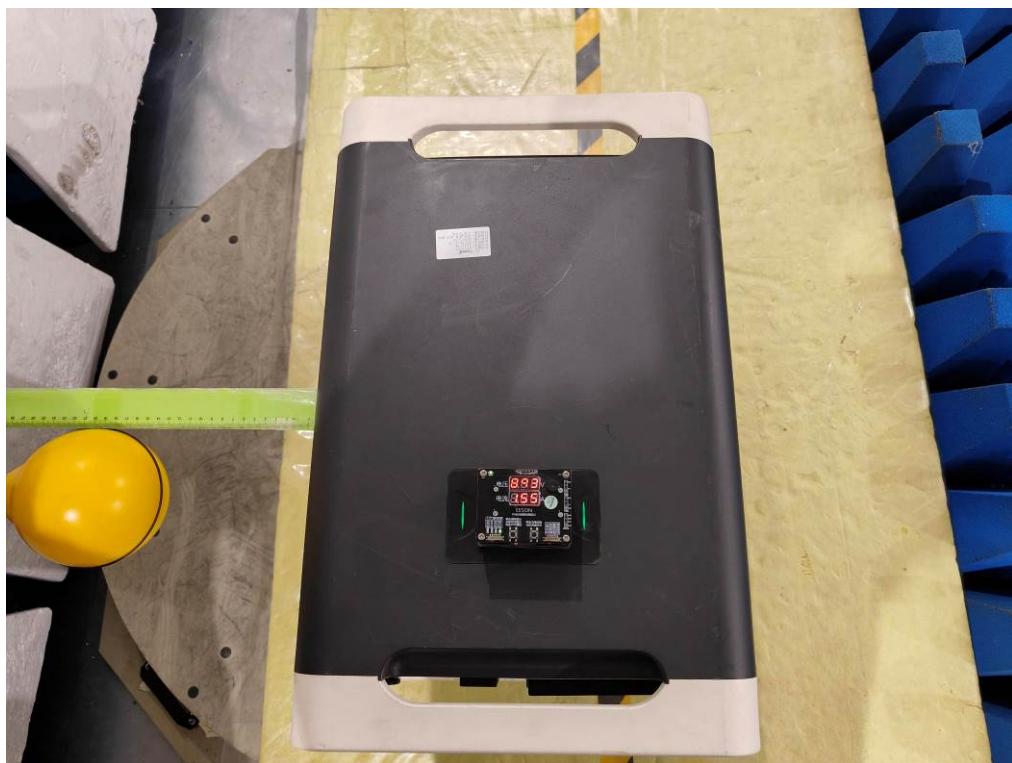
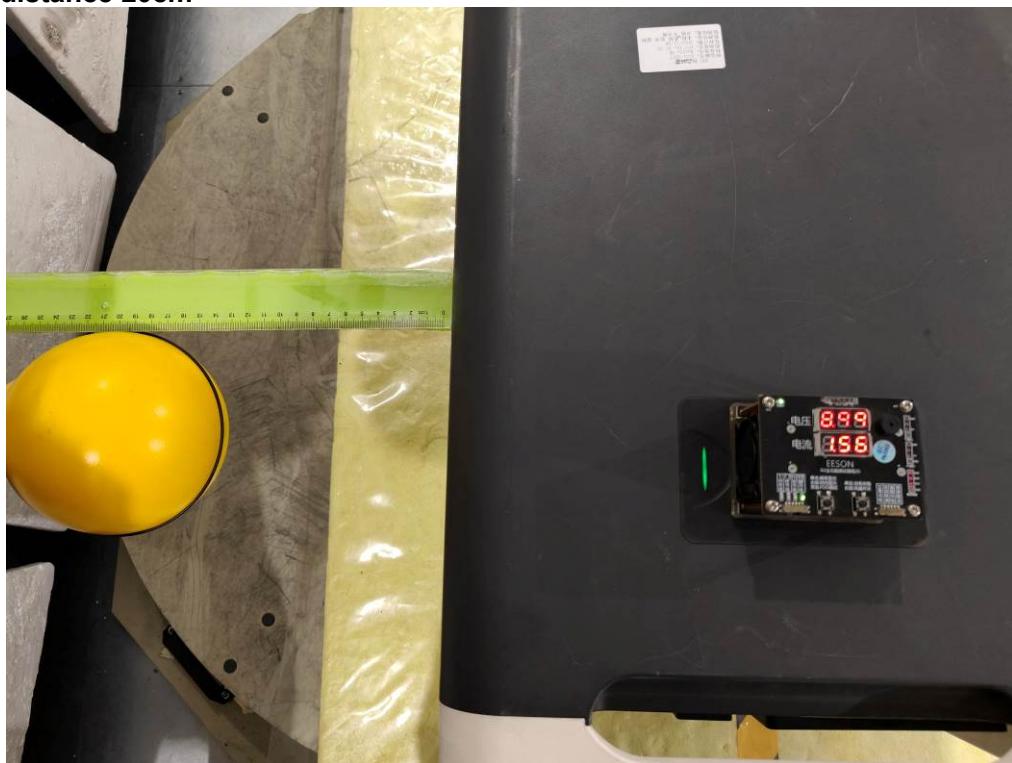
Side A: Test distance 20cm



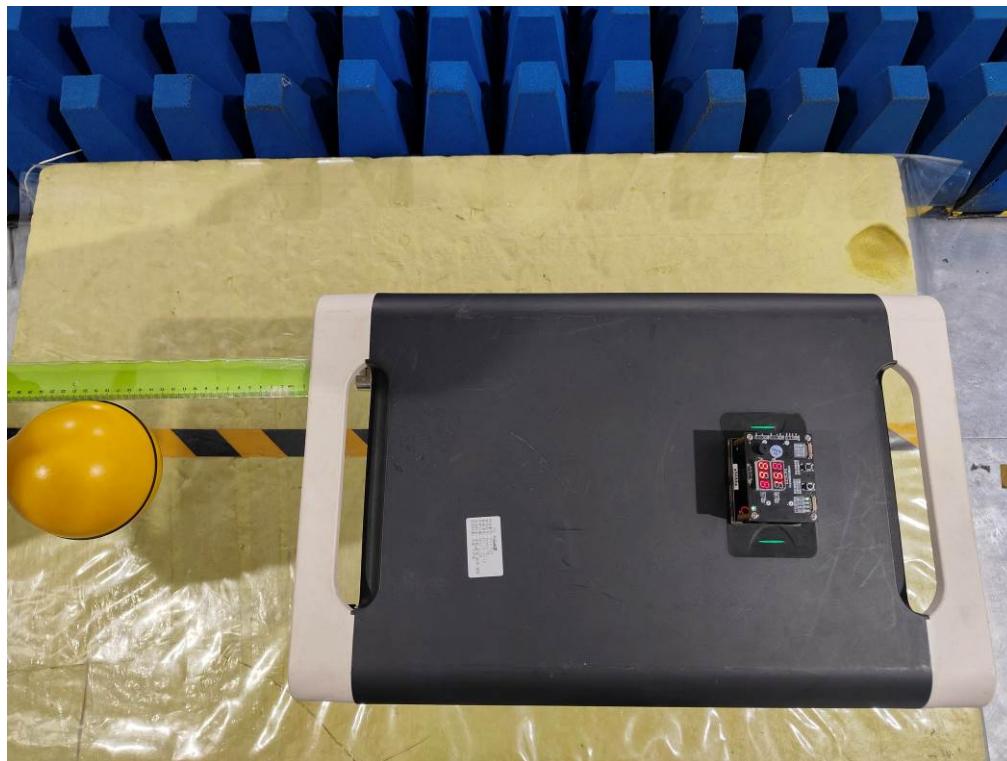
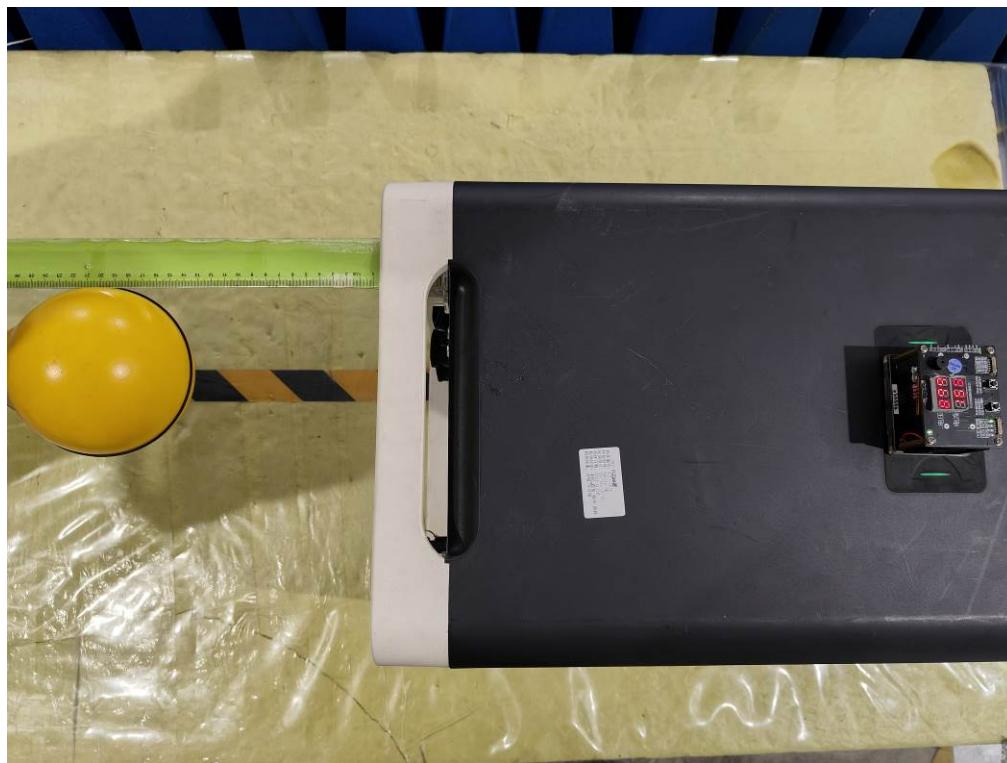
Side B: Test distance 20cm



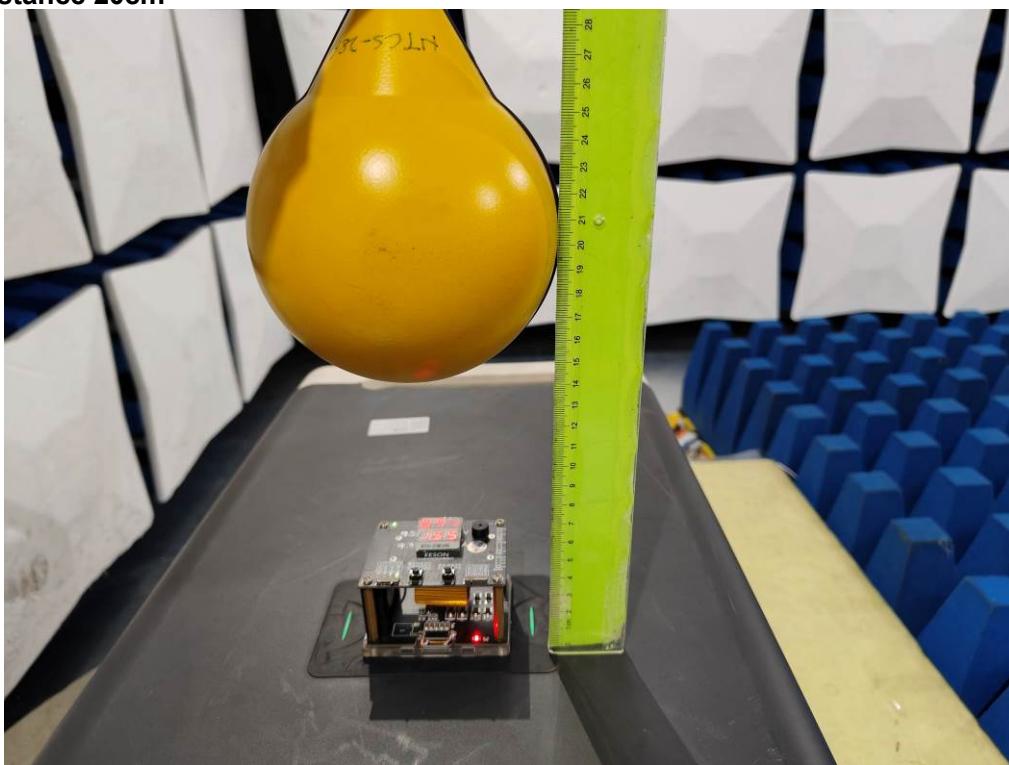
**Side C: Test distance 20cm**



**Side D: Test distance 20cm**



Side E: Test distance 20cm



---End---