

RF Exposure Evaluation

1 GENERAL INFORMATION

1.1 GENERAL DESCRIPTION OF EUT

Product Name:	Power Bank
Model No.:	Q3
Serial No.:	/
Hardware version:	V1.0
Software version:	/
Test Frequency:	147 KHz
Modulation type:	MSK
Antenna Type:	Inductive loop coil Antenna
Antenna gain:	0dBi
Power supply:	Type-C input: 5V/3A; 9V/2A; 12V/1.5A Lightning input: 5V/3A , 9V/2.2A USB-A output: 4.5V/5A; 5V/4.5A; 9V/2A ;12V/1.5A ; Built-in cable output: 5V/2A; 9V/2.22A; 12V/1.5A ; Wireless output: 15W Max

1.2 Test mode

Transmitting mode	
Mode1	Wireless output: 15W
Mode2	Wireless output: 10W
Mode3	Wireless output: 7.5W
Mode4	Wireless output: 5W

Note: Mode4 is worst wireless output mode.

Test channel

Channel	Test Frequency(KHz)
loop coil Antenna	147.0 KHz

The product conforms KDB 680106 D01 V03 Clause 5 b) as follows;

Requirements of KDB 680106 D01	Yes / No	Description
Power transfer frequency is less than 1MHz	Yes	The device operate in the frequency range 115.0 KHz - 205.0 KHz
Output power from each primary coil is less than 15 watts	Yes	The maximum output power of the primary coil $\leq 15W$.
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 single coil that is able to detect receiver device.
Client device is placed directly in contact with the transmitter.	Yes	Client device is placed directly in contact with the transmitter.
Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).	No	portable
The aggregate H-field strengths anywhere at or beyond 15 cm surrounding the device, and 20 cm away from the surface from all coils that by design can simultaneously transmit, and while those coils are simultaneously energized, are demonstrated to be less than 50% of the applicable MPE limit.	Yes	The EUT 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.

2 Measuring Standard

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines. According to §1.1310 and § 2.1093 RF exposure is calculated. According KDB680106 D01v03: RF Exposure Wireless Charging Apps v02.

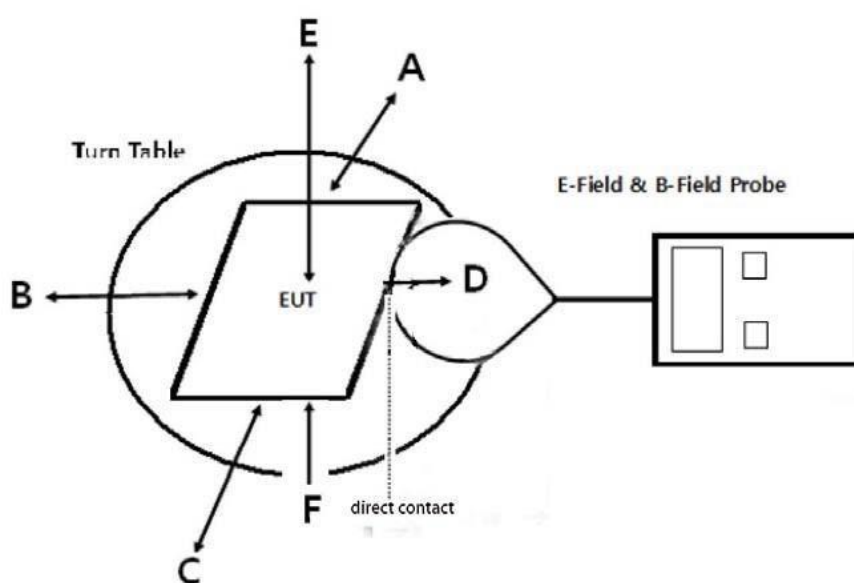
3 Limit requirement

Limits for Occupational / Controlled Exposure				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

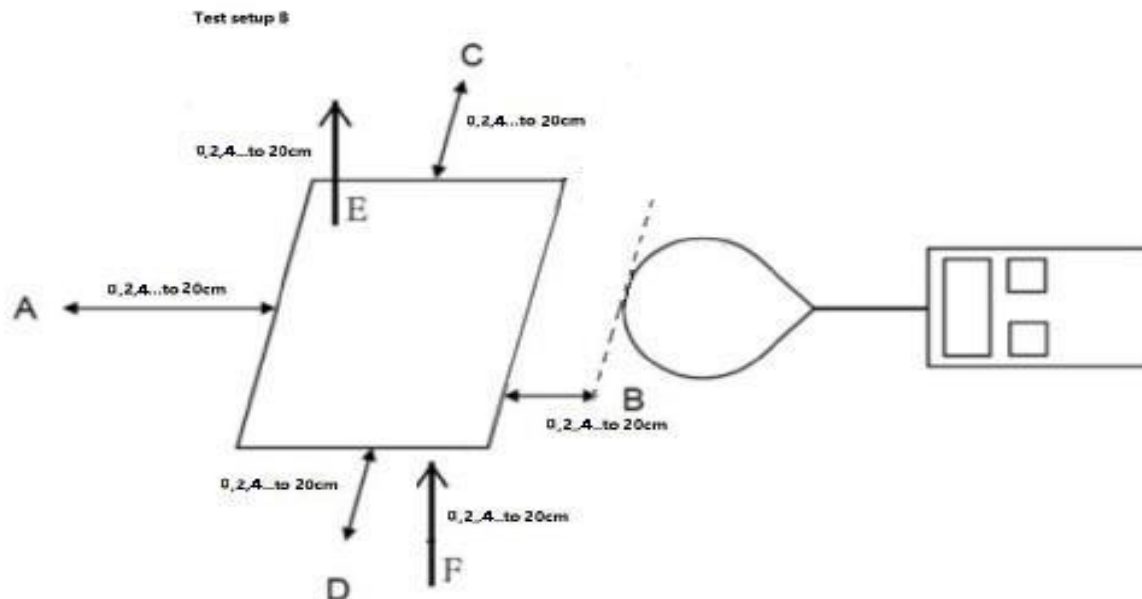
Limits for General Population / Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180 / f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1	30

4 Test Setup

A:



B:



5 Test Procedure

- The RF exposure test was performed in anechoic chamber.
- The measurement probe was placed at 0 cm surrounding the device for test setup A; and the measurement Probe was placed from 0 cm to 20 cm, in 2 cm maximum increment measured from the edge of the device For the test setup B.
- The highest emission level was recorded and compared with limit as soon as measurement of eachd) The highest emission level was recorded and compared with limit as soon as measurement of each points (A, B, C, D, E) were completed.
- The EUT was measured according to the dictates of KDB680106 D01v03r01

Remark:

The EUT's test position A, B, C, D , E and F is valid for the E and H field measurements.

6 Test Instruments list

Test Equipment	Manufacturer	Model No.	SN.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
Exposure Level Tester	Narda	ELT-400	N-0231	June. 26 2021	June. 25 2022
Magnetic field probe 100cm ²	Narda	ELT probe 100cm ²	M0675	June. 26 2021	June. 25 2022

7 Test Result

For setup A:

Note 1: Internal battery power mode

H-Filed Strength at 0 cm from edges surrounding the EUT (A/m)

Frequency Range (KHz)	Operation condition	Position A (A/m)	Position B (A/m)	Position C (A/m)	Position D (A/m)	Position E (A/m)	Position F (A/m)	Limits (A/m)
147KHz	Full load	0.28	0.23	0.23	0.21	0.17	0.15	1.63
147KHz	Half load	0.24	0.20	0.22	0.19	0.22	0.26	1.63
147KHz	No load	0.18	0.20	0.20	0.23	0.23	0.14	1.63

Note 2: AC power mode

H-Filed Strength at 0 cm from edges surrounding the EUT (A/m)

Frequency Range (KHz)	Operation condition	Position A (A/m)	Position B (A/m)	Position C (A/m)	Position D (A/m)	Position E (A/m)	Position F (A/m)	Limits (A/m)
147KHz	Full load	0.15	0.23	0.21	0.19	0.17	0.19	1.63
147KHz	Half load	0.20	0.26	0.21	0.21	0.19	0.15	1.63
147KHz	No load	0.16	0.16	0.20	0.23	0.22	0.15	1.63

For setup B:

Note 1: Internal battery power mode

For full load mode:

H-Filed Strength at (distance from 0cm to 20cm at 2cm iteration) surrounding the EUT (A/m)

Test distance (cm)	Position A (A/m)	Position B (A/m)	Position C (A/m)	Position D (A/m)	Position E (A/m)	Position F (A/m)	Limits (A/m)
0	0.21	0.18	0.21	0.19	0.21	0.21	1.63
2	0.19	0.15	0.21	0.17	0.19	0.18	1.63
4	0.19	0.15	0.23	0.21	0.22	0.18	1.63
6	0.24	0.18	0.27	0.24	0.23	0.20	1.63
8	0.24	0.15	0.26	0.23	0.21	0.17	1.63
10	0.22	0.15	0.25	0.22	0.20	0.17	1.63
12	0.19	0.15	0.24	0.21	0.18	0.14	1.63
14	0.17	0.14	0.23	0.19	0.16	0.12	1.63
18	0.15	0.13	0.23	0.17	0.14	0.11	1.63
20	0.13	0.11	0.23	0.17	0.12	0.11	1.63

For half Load mode:

H-Filed Strength at (distance from 0cm to 20cm at 2cm iteration) surrounding the EUT (A/m)

Test distance (cm)	Position A (A/m)	Position B (A/m)	Position C (A/m)	Position D (A/m)	Position E (A/m)	Position F (A/m)	Limits (A/m)
0	0.19	0.19	0.17	0.18	0.22	0.20	1.63
2	0.16	0.19	0.15	0.16	0.20	0.20	1.63
4	0.18	0.19	0.16	0.21	0.27	0.20	1.63
6	0.22	0.23	0.21	0.24	0.34	0.23	1.63
8	0.21	0.21	0.19	0.24	0.32	0.21	1.63
10	0.19	0.20	0.19	0.23	0.29	0.18	1.63
12	0.17	0.19	0.18	0.22	0.28	0.16	1.63
14	0.14	0.19	0.17	0.19	0.27	0.16	1.63
18	0.13	0.18	0.14	0.17	0.24	0.13	1.63
20	0.11	0.18	0.14	0.16	0.24	0.11	1.63

For no Load mode:

H-Filed Strength at (distance from 0cm to 20cm at 2cm iteration) surrounding the EUT (A/m)

Test distance (cm)	Position A (A/m)	Position B (A/m)	Position C (A/m)	Position D (A/m)	Position E (A/m)	Position F (A/m)	Limits (A/m)
0	0.22	0.20	0.19	0.18	0.21	0.19	1.63
2	0.19	0.18	0.17	0.17	0.20	0.18	1.63
4	0.21	0.22	0.24	0.18	0.21	0.23	1.63
6	0.27	0.28	0.29	0.25	0.23	0.24	1.63
8	0.24	0.27	0.27	0.22	0.21	0.23	1.63
10	0.21	0.25	0.24	0.21	0.21	0.21	1.63
12	0.19	0.22	0.22	0.21	0.21	0.20	1.63
14	0.17	0.21	0.20	0.20	0.19	0.20	1.63
18	0.14	0.20	0.18	0.19	0.17	0.18	1.63
20	0.12	0.18	0.17	0.16	0.17	0.17	1.63

Note 2: AC power mode

For full load mode:

H-Filed Strength at (distance from 0cm to 20cm at 2cm iteration) surrounding the EUT (A/m)

Test distance (cm)	Position A (A/m)	Position B (A/m)	Position C (A/m)	Position D (A/m)	Position E (A/m)	Position F (A/m)	Limits (A/m)
0	0.18	0.19	0.18	0.18	0.20	0.18	1.63
2	0.16	0.18	0.18	0.18	0.20	0.17	1.63
4	0.19	0.20	0.24	0.25	0.25	0.21	1.63
6	0.22	0.23	0.30	0.25	0.29	0.25	1.63
8	0.22	0.21	0.28	0.24	0.28	0.22	1.63
10	0.21	0.20	0.27	0.22	0.25	0.21	1.63
12	0.20	0.18	0.26	0.20	0.23	0.19	1.63
14	0.19	0.17	0.26	0.19	0.20	0.18	1.63
18	0.17	0.16	0.23	0.17	0.20	0.15	1.63
20	0.15	0.16	0.20	0.16	0.18	0.13	1.63

For half Load mode:

H-Filed Strength at (distance from 0cm to 20cm at 2cm iteration) surrounding the EUT (A/m)

Test distance (cm)	Position A (A/m)	Position B (A/m)	Position C (A/m)	Position D (A/m)	Position E (A/m)	Position F (A/m)	Limits (A/m)
0	0.20	0.17	0.19	0.20	0.22	0.20	1.63
2	0.18	0.16	0.17	0.19	0.19	0.18	1.63
4	0.21	0.17	0.22	0.22	0.22	0.22	1.63
6	0.27	0.17	0.28	0.22	0.25	0.23	1.63
8	0.25	0.17	0.26	0.20	0.22	0.22	1.63
10	0.23	0.15	0.25	0.18	0.21	0.20	1.63
12	0.23	0.14	0.24	0.18	0.18	0.18	1.63
14	0.21	0.12	0.22	0.17	0.16	0.15	1.63
18	0.18	0.10	0.20	0.15	0.13	0.15	1.63
20	0.16	0.12	0.20	0.14	0.10	0.14	1.63

For no Load mode:

H-Filed Strength at (distance from 0cm to 20cm at 2cm iteration) surrounding the EUT (A/m)

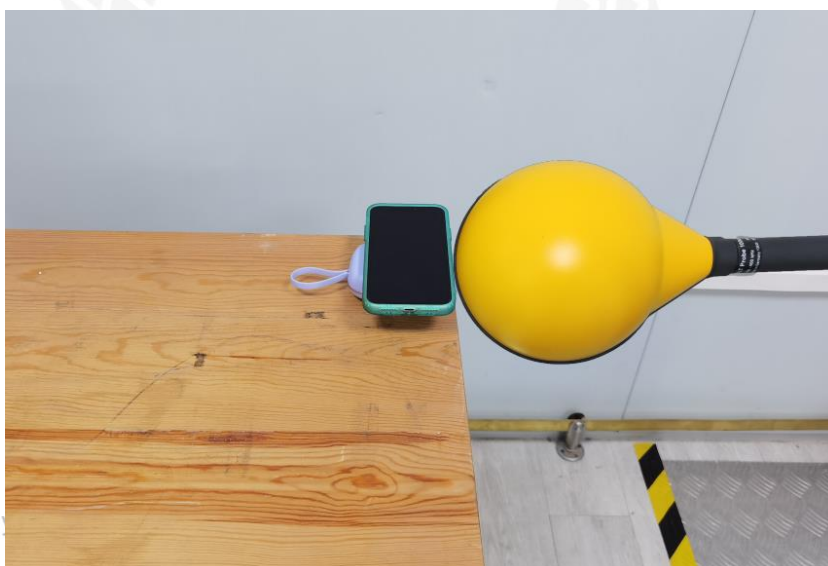
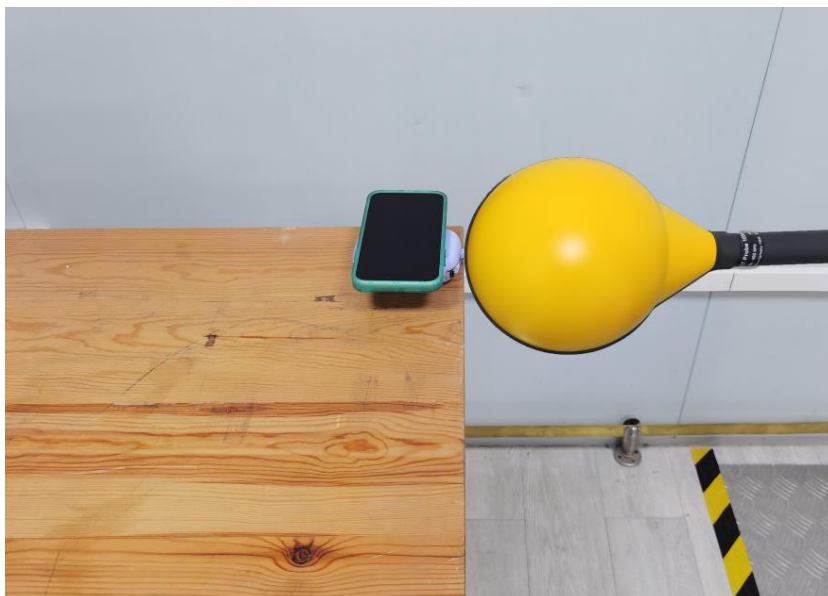
Test distance (cm)	Position A (A/m)	Position B (A/m)	Position C (A/m)	Position D (A/m)	Position E (A/m)	Position F (A/m)	Limits (A/m)
0	0.21	0.21	0.22	0.20	0.20	0.19	1.63
2	0.19	0.19	0.19	0.18	0.20	0.17	1.63

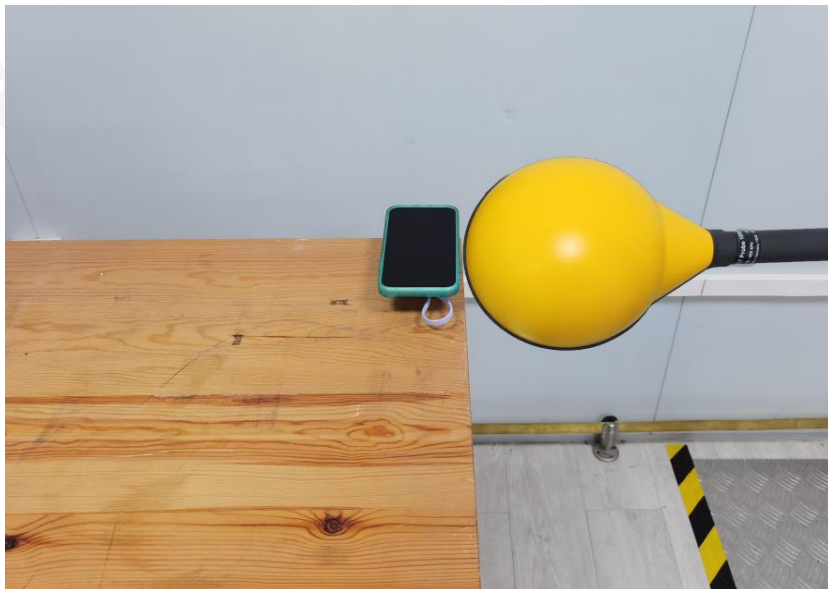
4	0.21	0.19	0.21	0.20	0.23	0.21	1.63
6	0.28	0.22	0.28	0.21	0.25	0.23	1.63
8	0.26	0.20	0.27	0.19	0.24	0.21	1.63
10	0.26	0.17	0.25	0.19	0.24	0.20	1.63
12	0.24	0.16	0.23	0.18	0.24	0.19	1.63
14	0.24	0.13	0.21	0.17	0.21	0.17	1.63
18	0.21	0.13	0.20	0.14	0.20	0.17	1.63
20	0.19	0.10	0.17	0.14	0.19	0.14	1.63

Note: In the frequency range of 1kHz-10MHz, except the fundamental frequency, other transmissions of the power transmission system are less than 20dB lower than the maximum fundamental transmission, so it is not necessary to evaluate.

8 Test Set-up Photo

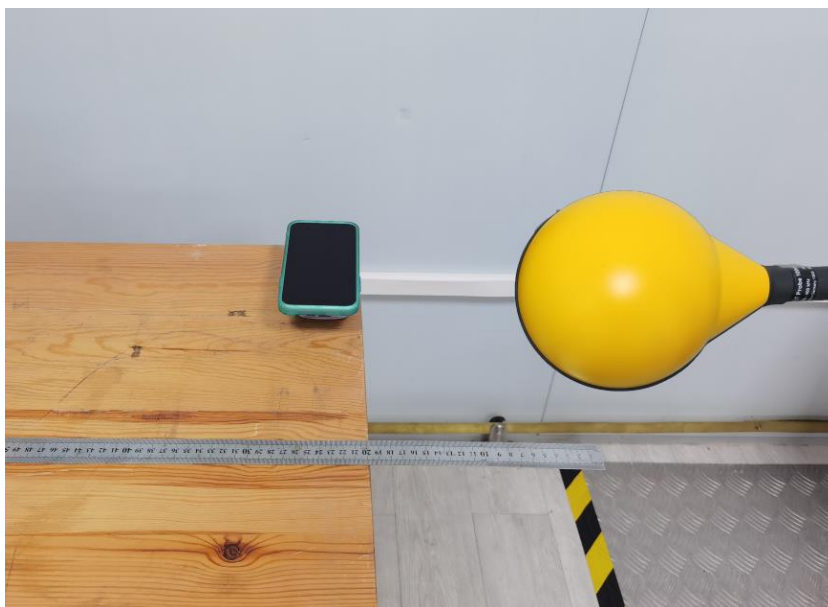
0 cm

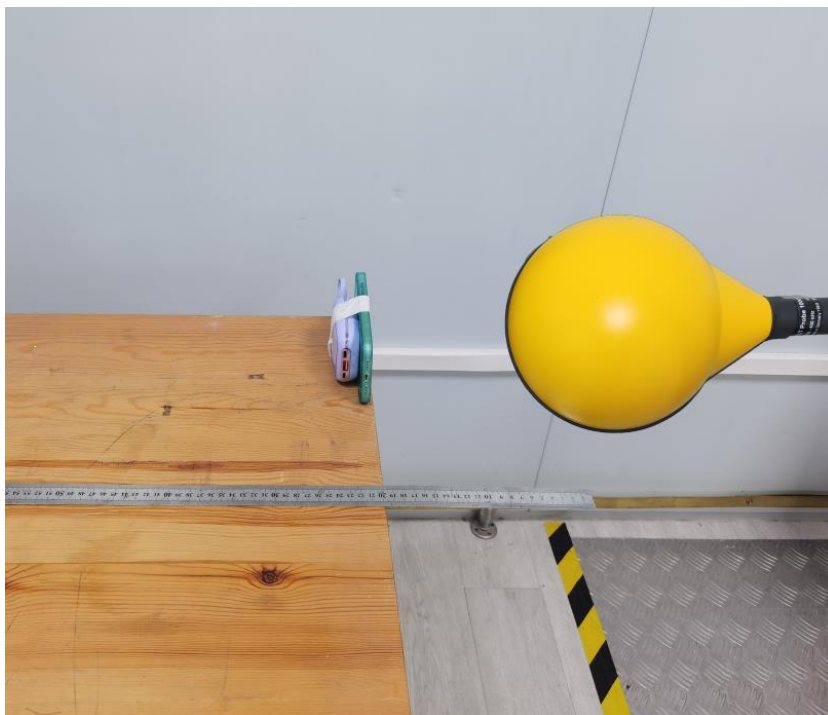
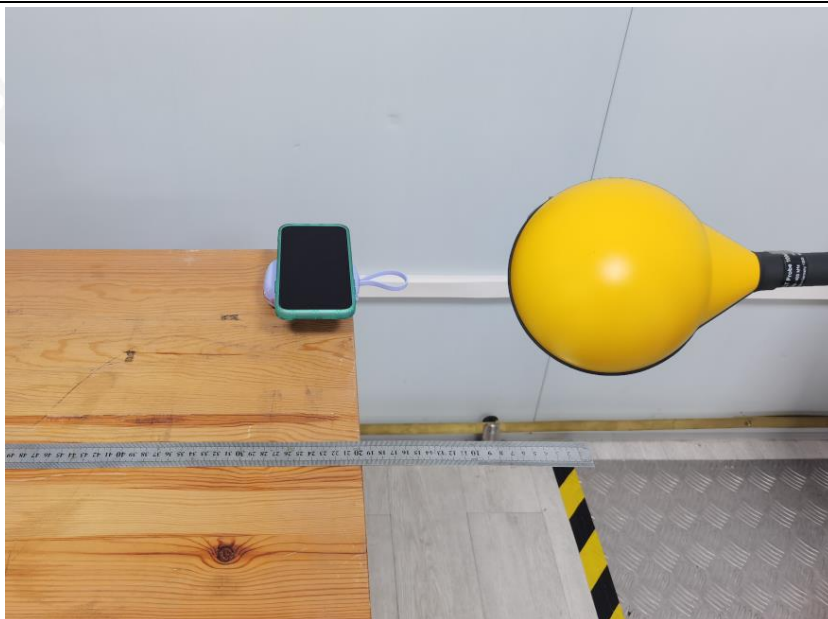


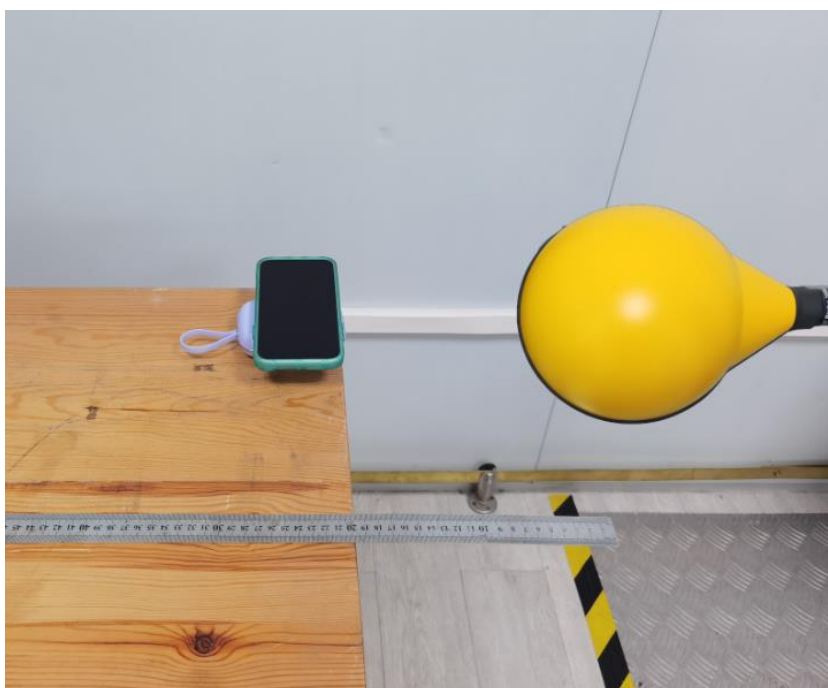
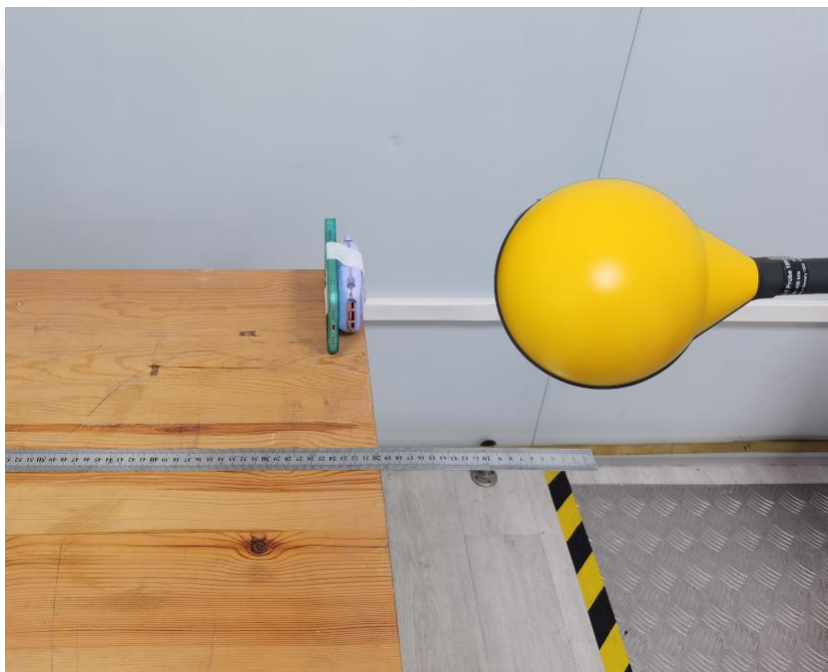


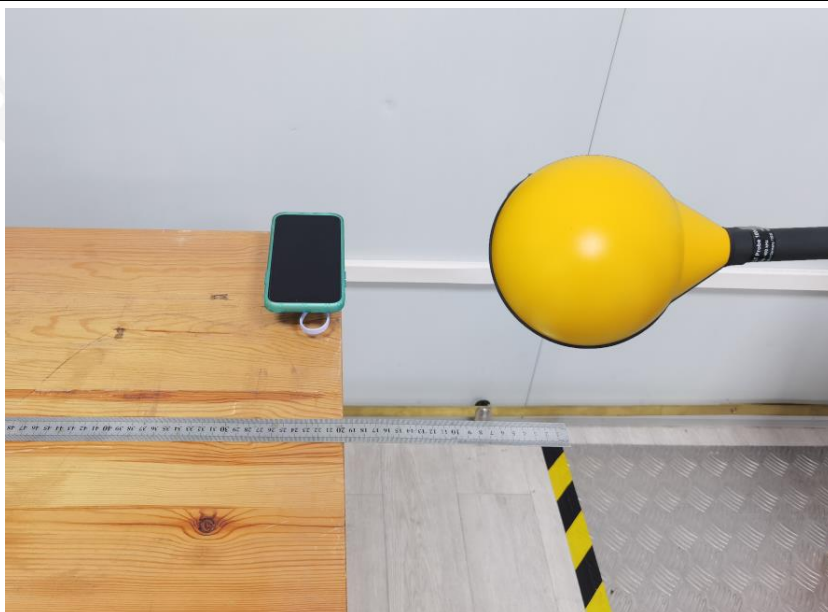


20 cm









20cm -AC

