

FCC 47 CFR MPE REPORT

mophie LLC

mophie 3-in-1 wireless charging pad

Model Number: WRLS-MULTI-WATCH

FCC ID: 2ACWB-MULTIA

Prepared for:	mophie LLC
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Report Number:	ESTE-R1909120
Date of Test:	Jul. 09~Sep. 20, 2019
Date of Report:	Sep. 24, 2019

Environmental evaluation and exposure limit according to FCC CFR 47 Part 1.1307(b), 1.1310

1. Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Average Time (minutes)
(A) Limits for Occupational / Control Exposures				
0.3-3.0	614	1.63	*(100)	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30

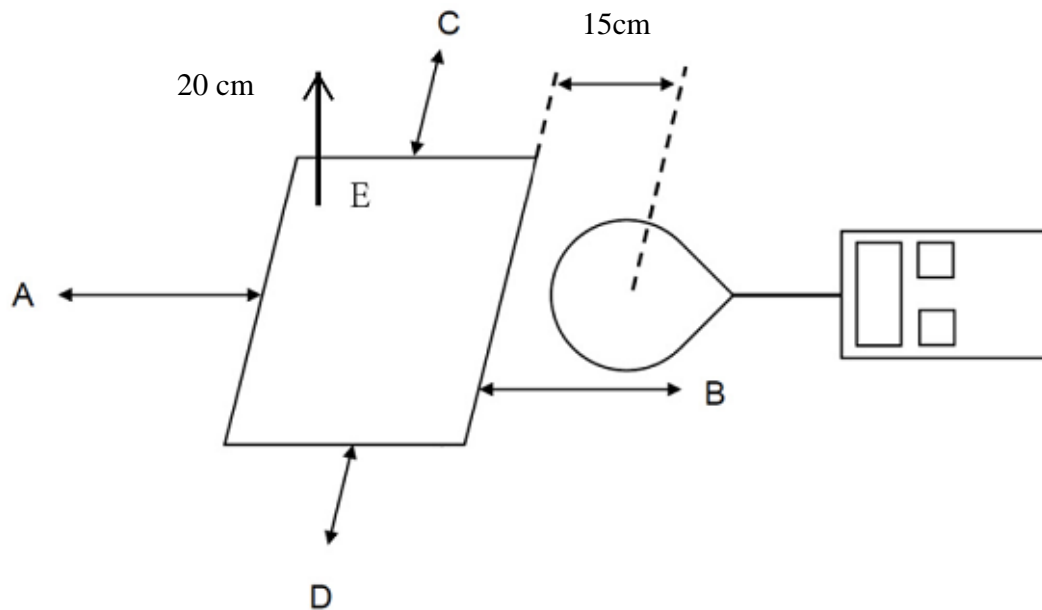
“*” means Plane-wave equivalent power density

2. Test equipment

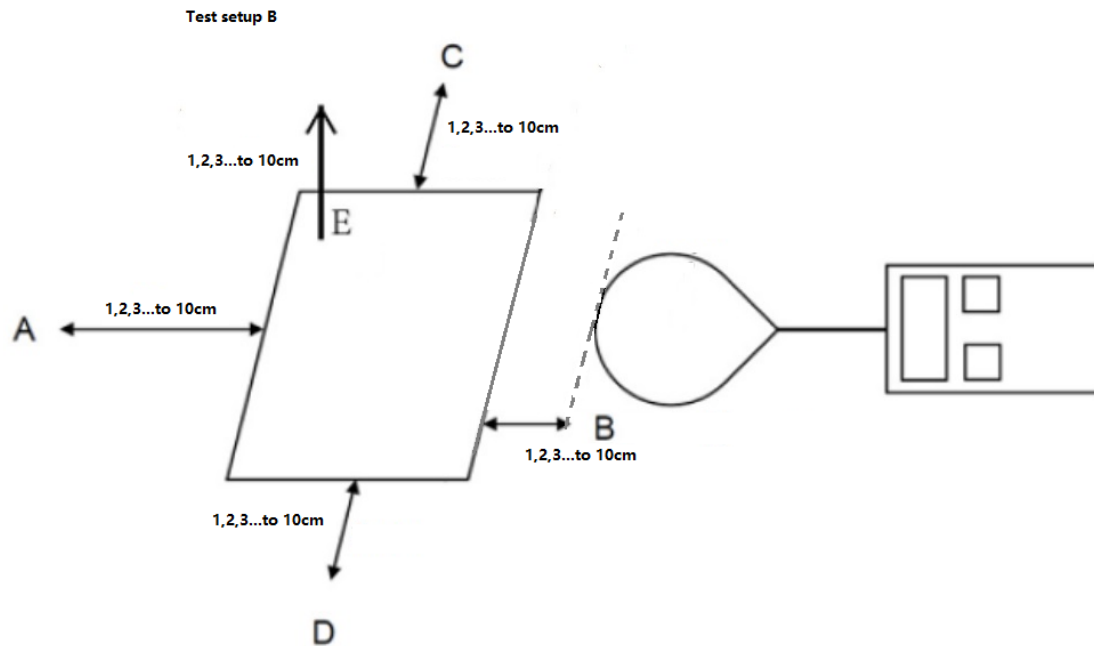
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
E-Magnetic field probe	Narda	2304/03	M-0018	June,29,18	1 Year
Broadband field meter	Narda	ELT-400	N-0045	June,29,18	1 Year

3. Test setup

A:



B:



- a. The test was performed on 360 degree turn table in anechoic chamber.
- b. The probe was placed at 15 cm surrounding the device and 20 cm above the top of the charger and the geometric centre of the probe, for test setup A.
- c. Measure magnetic and electrical field strength at a distance 10cm to 1cm at 1cm iteration, Which is between the edge of the charger and the edge of of probe, for test setup B.
- d. The highest emission level was recorded and compared with limit as soon as measurement of each point; A, B, C, D, E were completed.
- e. The EUT was measured according to the dictates of KDB680106D01v03;

4. Equipment Approval Considerations

According to the item 5(b) of KDB 680106 D01 RF Exposure Wireless Charging App v03:

Inductive wireless power transfer applications that meets KDB 680106 Clause 5(b) 6 conditions are excluded from submitting an RF exposure evaluation.

1	Power transfer frequency is less than 1 MHz
	YES; the device operated in the frequency range from 110.5-326.5KHz.
2	Output power from each primary coil is less than or equal to 15 watts.
	NO; the maximum output power of the primary coil is 18W.
3	The transfer system includes only single primary and secondary coils. This includes charging systems that may have multiple primary coils and clients that are able to detect and allow coupling only between individual pairs of coils.
	YES; the transfer system includes only single primary and secondary coils.
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
6	The aggregate 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.
	YES; The EUT field strength levels are 50% x MPE limits.

5. Test Mode

Mode	Description
Charging mode with dummy load	Full Load
	Half Load
	Empty Load

6. E-Field Test Result

Test Mode	Full Load	Half Load	Empty Load
Frequency range (kHz)	110.5 to 326.5 kHz		
Position A(V/m)	7.562	5.265	3.251
Position B(V/m)	7.452	5.214	3.325
Position C(V/m)	7.524	5.241	3.215
Position D(V/m)	7.325	5.325	3.251
Position E(V/m)	7.451	5.211	3.115
Limits (V/m)	614		
50% Limits(V/m)	307		

7. H-Field Test Result

Test Mode	Full Load	Half Load	Empty Load
Frequency range (kHz)	110.5 to 326.5 kHz		
Position A(A/m)	0.251	0.204	0.157
Position B(A/m)	0.240	0.200	0.166
Position C(A/m)	0.214	0.209	0.164
Position D(A/m)	0.224	0.197	0.159
Position E(A/m)	0.236	0.222	0.177
Limits (A/m)	1.63		
50% Limits (A/m)	0.815		

Test Result for Test setup B:

Empty , Half , Full load all have been tested ,only worse case Max load (Full) is reported.

E-Filed Strength at (distance 10cm to 1cm at 1cm iteration, i.e. at a distance of 10cm, 9cm, 8cm, 1cm, Which is between the edge of the charger and the edge of of probe,) surrounding the EUT (V/m)

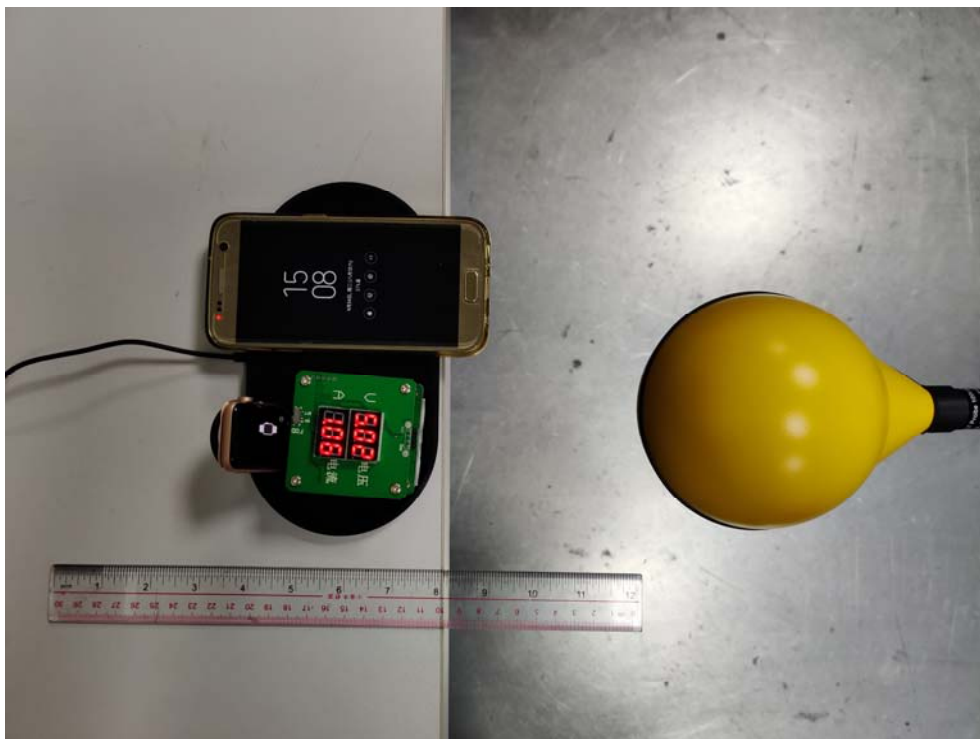
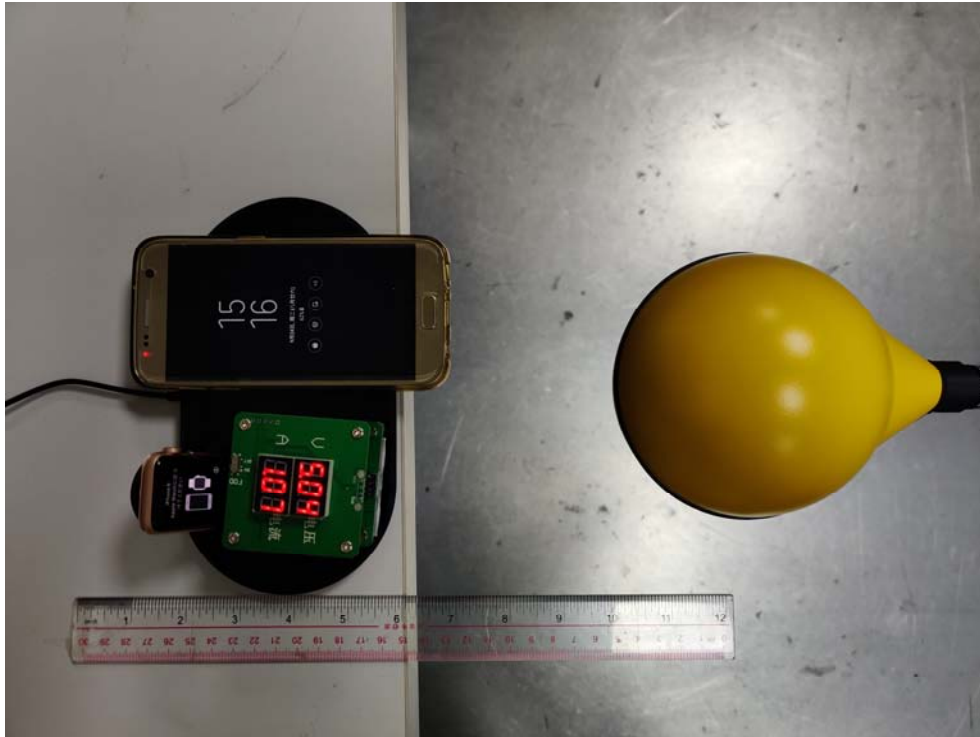
Test distance (cm)	Position A (V/m)	Position B (V/m)	Position C (V/m)	Position D (V/m)	Position E (V/m)	Limits (V/m)
1	7.641	7.648	7.661	7.645	7.633	614
2	7.640	7.647	7.650	7.633	7.613	614
3	7.635	7.644	7.656	7.625	7.603	614
4	7.615	7.618	7.617	7.618	7.598	614
5	7.614	7.615	7.616	7.615	7.591	614
6	7.603	7.605	7.606	7.607	7.559	614
7	7.599	7.601	7.585	7.578	7.535	614
8	7.598	7.599	7.529	7.530	7.515	614
9	7.589	7.455	7.525	7.535	7.455	614
10	7.562	7.452	7.524	7.325	7.451	614

H-Filed Strength at (distance 10cm to 1cm at 1cm iteration, i.e. at a distance of 10cm, 9cm, 8cm, 1cm, Which is between the edge of the charger and the edge of of probe,) surrounding the EUT (A/m)

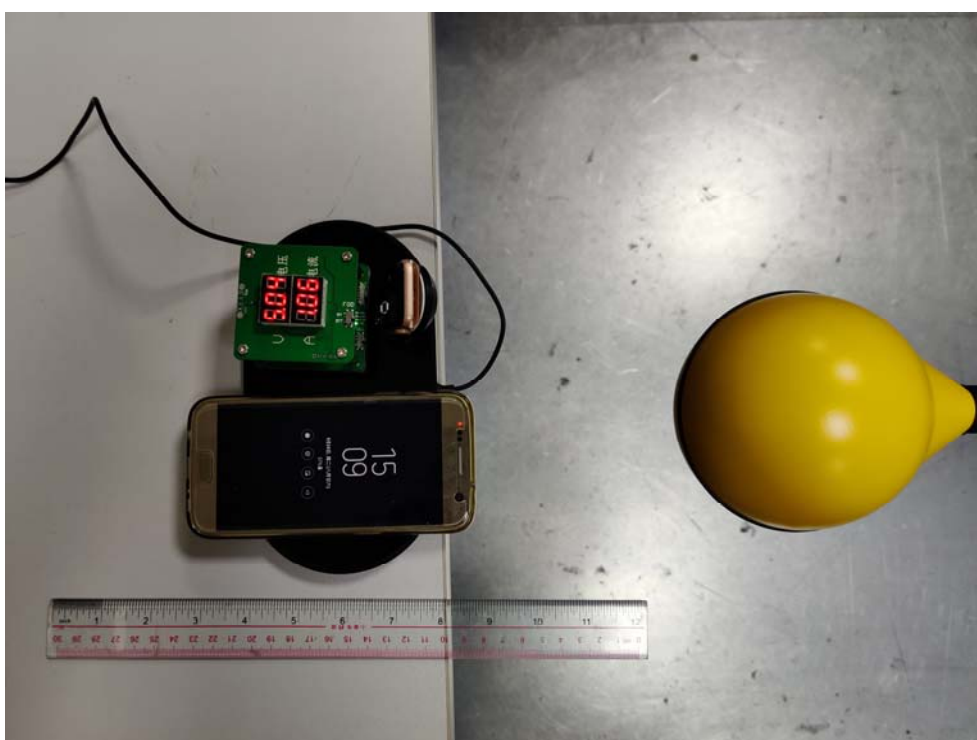
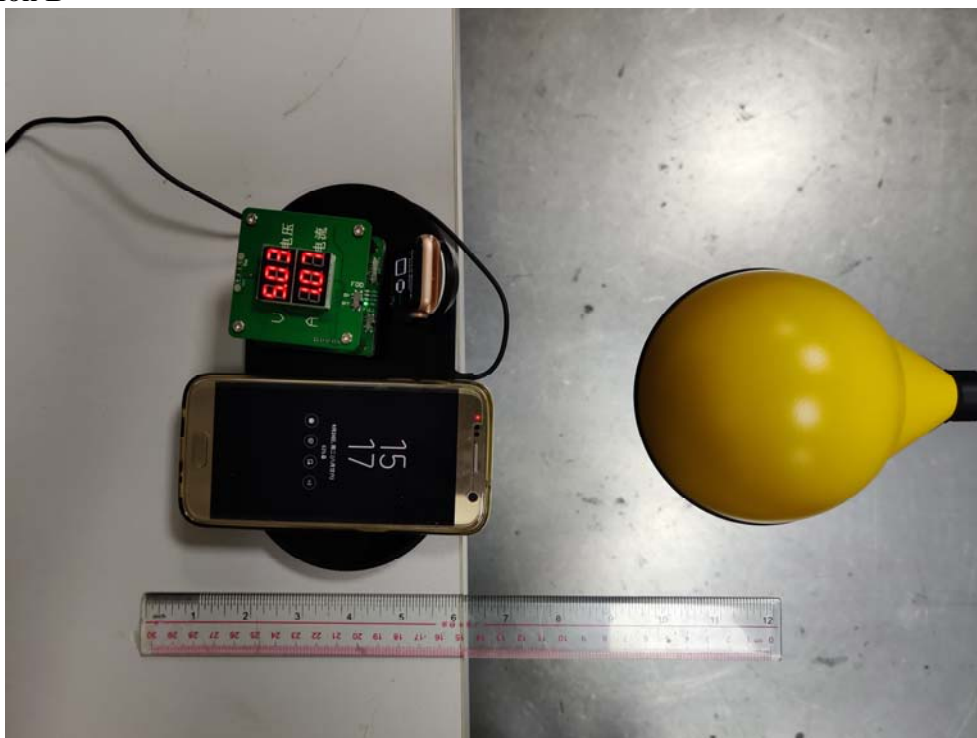
Test distance (cm)	Position A (A/m)	Position B (A/m)	Position C (A/m)	Position D (A/m)	Position E (A/m)	Limits (A/m)
1	0.450	0.466	0.478	0.488	0.499	1.63
2	0.354	0.377	0.378	0.365	0.354	1.63
3	0.310	0.322	0.322	0.310	0.335	1.63
4	0.290	0.288	0.278	0.299	0.311	1.63
5	0.289	0.278	0.281	0.299	0.305	1.63
6	0.277	0.265	0.278	0.274	0.275	1.63
7	0.275	0.257	0.268	0.270	0.299	1.63
8	0.269	0.254	0.244	0.268	0.278	1.63
9	0.268	0.260	0.254	0.255	0.268	1.63
10	0.245	0.248	0.233	0.225	0.247	1.63

8. Test Setup Photo

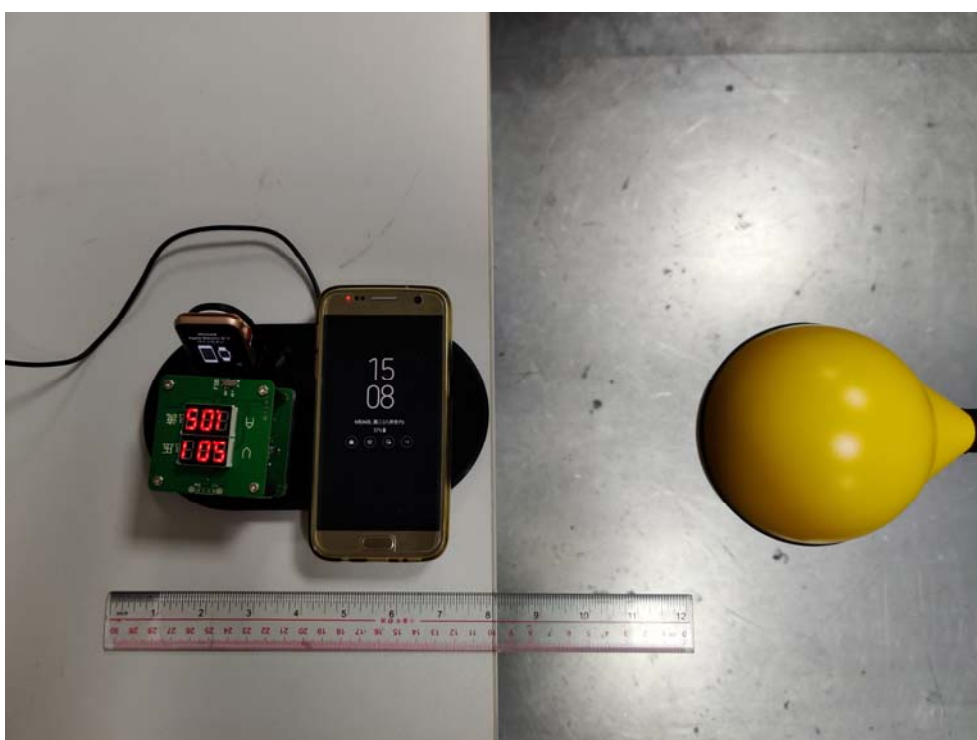
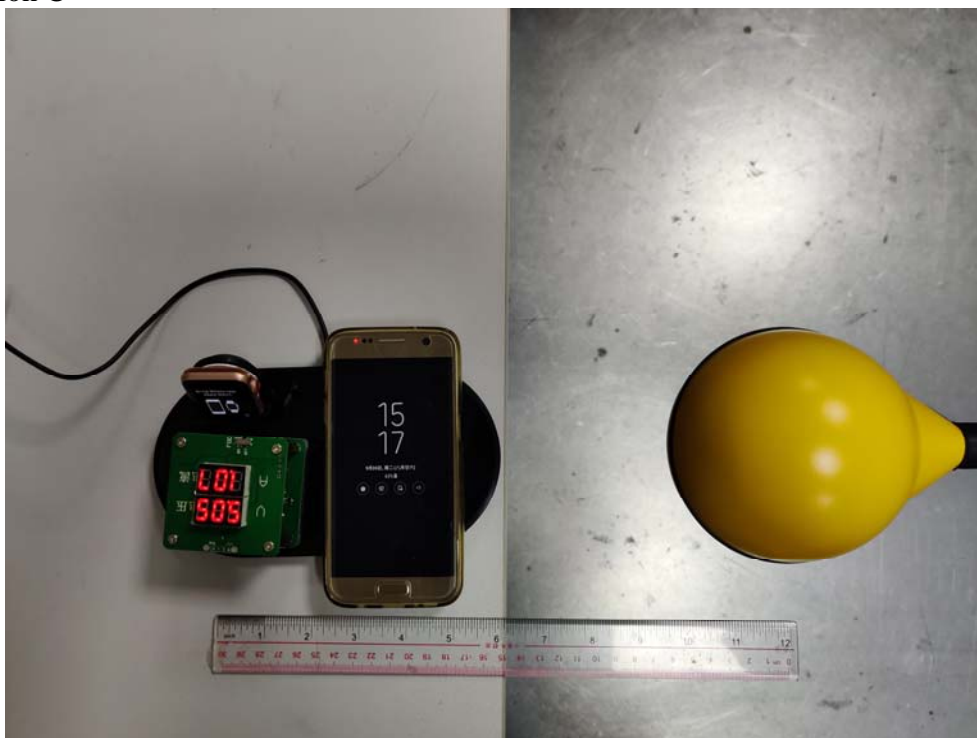
Position A



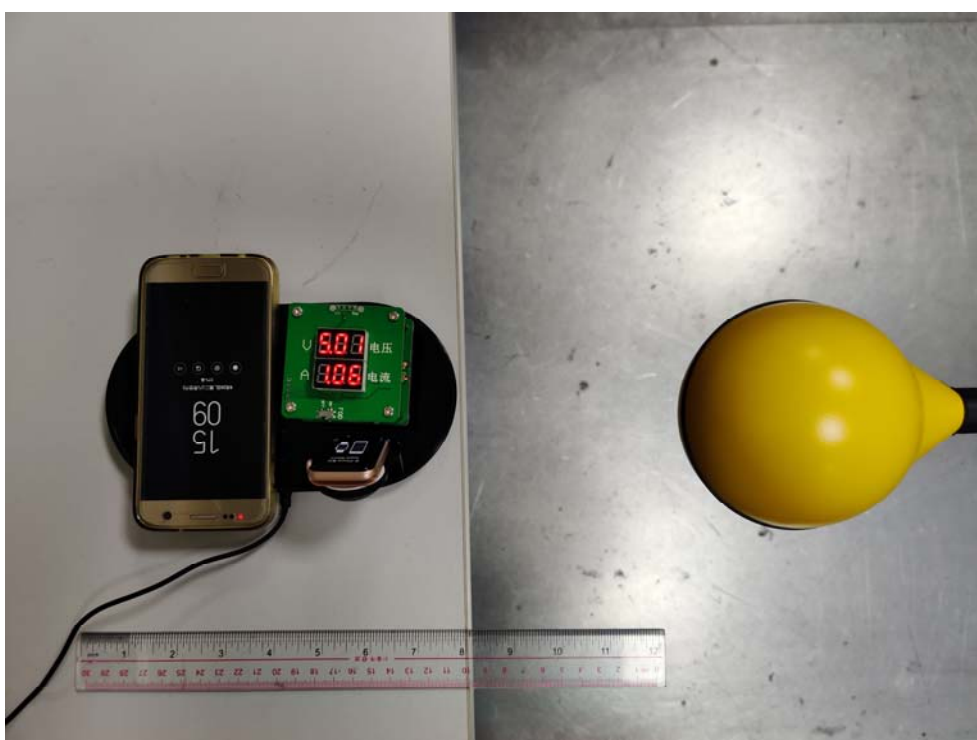
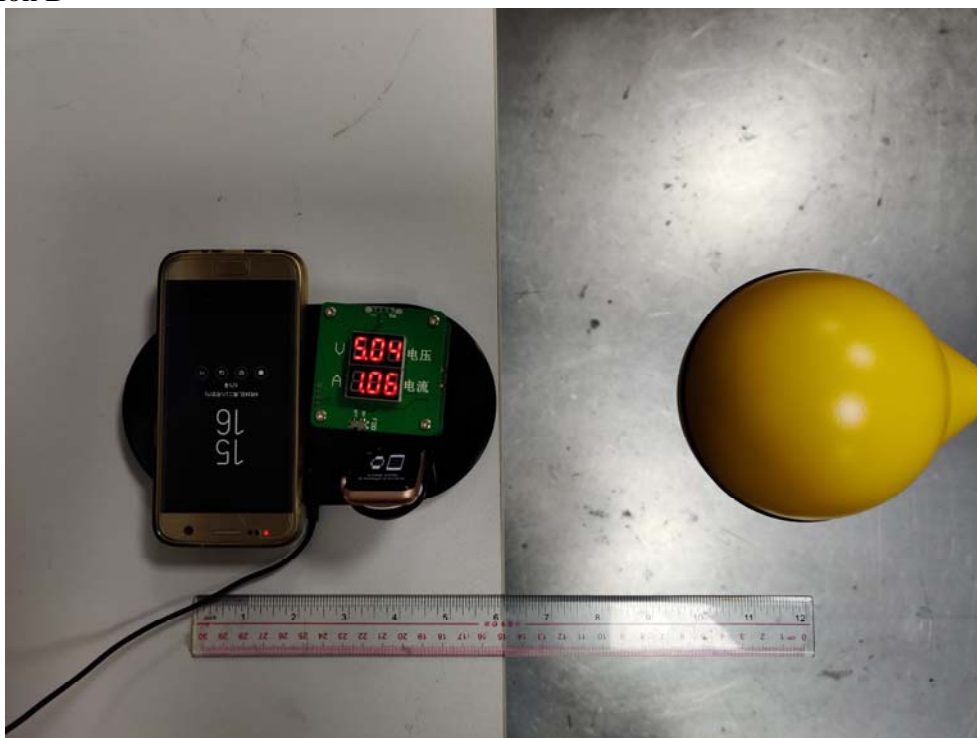
Position B



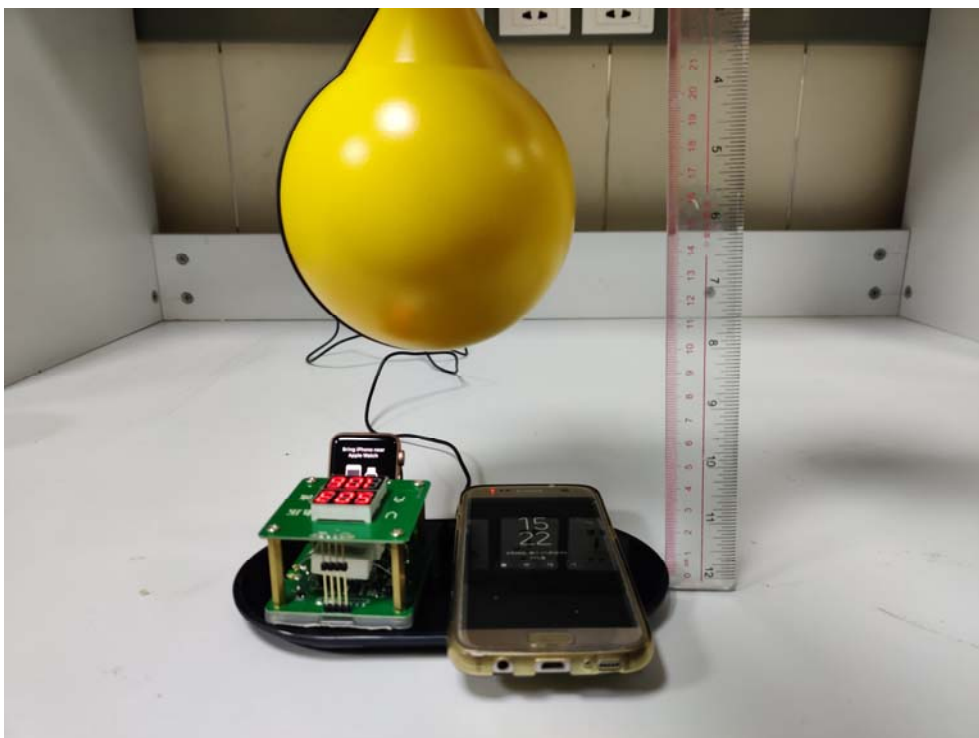
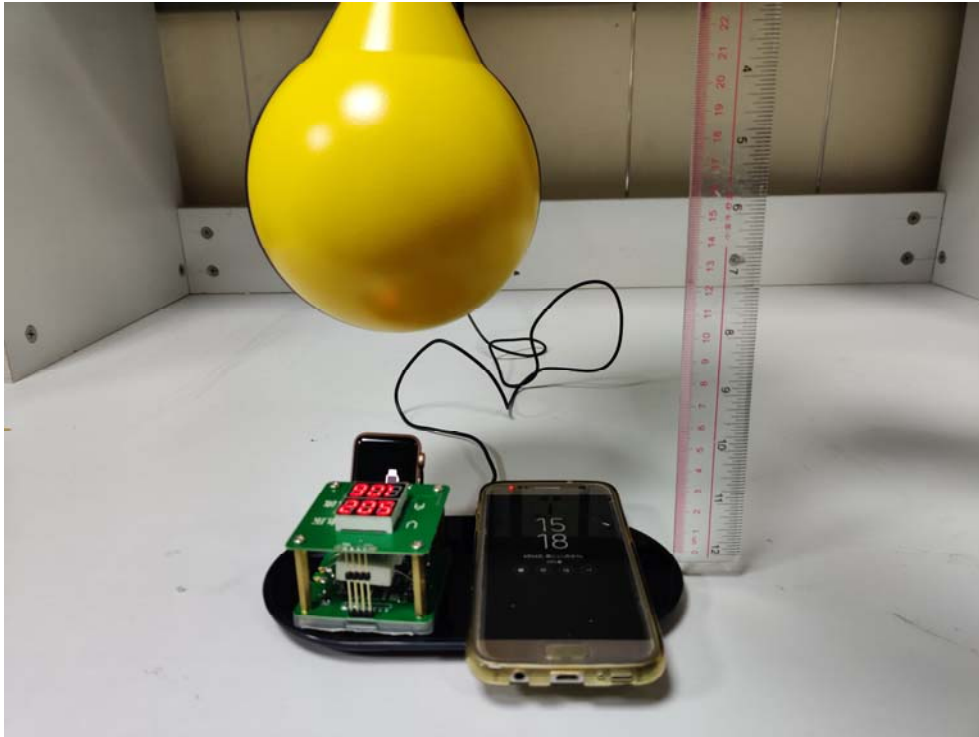
Position C



Position D



Position E



Note: The dummy load must be placed horizontal of the EUT at the top.(Parallel to the coil)
=====END=====