

RF Exposure Considerations

FCC ID. :	2A3VSBXF-20212802	
Test Report No..... :	TCT211202E020	
Date of issue..... :	Jan. 21, 2022	
Testing laboratory	SHENZHEN TONGCE TESTING LAB	
Testing location/ address:	TCT Testing Industrial Park Fuqiao 5th Industrial Zone, Fuhai Street, Bao'an District Shenzhen, Guangdong, 518103, People's Republic of China	
Applicant's name..... :	Shenzhen Willsoon Electronic Technology Co., Ltd	
Address..... :	Floor 5, Nanken No.2 Industrial Bantian, Longgang, Shenzhen, China	
Manufacturer's name ... :	Shenzhen Willsoon Electronic Technology Co., Ltd	
Address..... :	Floor 5, Nanken No.2 Industrial Bantian, Longgang, Shenzhen, China	
Standard(s)	KDB 680106 D01 RF Exposure Wireless Charging Apps v03	
Test item description	MAGNETIC POWER BANK	
Trade Mark	iJOY	
Model/Type reference..... :	IJPB210136, MGPB202101, MGPB202102, IJPB210135	
Rating(s)	Rechargeable Li-ion Battery DC 3.7V	
Date of receipt of test item	Dec. 02, 2021	
Date (s) of performance of test..... :	Dec. 02, 2021 ~ Jan. 21, 2022	
Tested by (+signature) ... :	Rleo LIU	
Check by (+signature).... :	Beryl ZHAO	
Approved by (+signature):	Tomsin	

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Table of Contents

1. General Product Information	3
1.1. EUT description	3
1.2. Model(s) list.....	3
2. General Information.....	4
2.1. Test environment and mode.....	4
2.2. Description of Support Units.....	4
3. Facilities and Accreditations	5
3.1. Facilities	5
3.2. Location	5
3.3. Measurement Uncertainty.....	5
4. Test Results and Measurement Data	6
4.1. Measuring Standard	6
4.2. Requirements.....	6
4.3. Test Setup(worst case)	7
4.4. Test Procedure	7
4.5. Test Equipment List	7
4.6. Test Result	8
4.7. Test Set-up Photo.....	11

1. General Product Information

1.1.EUT description

Test item description	MAGNETIC POWER BANK
Model/Type reference.....	IJPB210136
Sample Number.....	TCT211202E008-0101
Operation Frequency	115.71kHz – 161.86kHz
Center frequency.....	122.31 kHz
Output power.....	5W
Power Supply.....	Power input:5V/2A Power output:5V/2A Wireless charging output:5W
Modulation Technology	Load modulation
Antenna Type.....	Inductive loop coil Antenna
Rating(s)	Rechargeable Li-ion Battery DC 3.7V

Note: The antenna gain listed in this report is provided by applicant, and the test laboratory is not responsible for this parameter.

1.2.Model(s) list

No.	Model No.	Tested with
1	IJPB210136	☒
Other models	MGPB202101, MGPB202102, IJPB210135	☐

Note: IJPB210136 is tested model, other models are derivative models. The models are identical in circuit and PCB layout, only different on the model names. So the test data of IJPB210136 can represent the remaining models.

2. General Information

2.1. Test environment and mode

Operating Environment:		
Condition	Conducted Emission	Radiated Emission
Temperature:	25.0 °C	25.3 °C
Humidity:	55 % RH	54 % RH
Atmospheric Pressure:	1010 mbar	1010 mbar
Test Mode:		
Mode	Mode1	Mode2
AC mode	Wireless Charging 5W	Wireless Charging 5W+full load output
Internal Battery Mode	Wireless Charging 5W	Wireless Charging 5W+full load output
The sample was placed 0.8m for the measurement below 1GHz above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case(Z axis) are shown in Test Results of the following pages.		

2.2. Description of Support Units

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.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
Magnetic field meter	NARDA	EHP-200A	Mar. 07, 2022	Magnetic field meter
Mobile Phone	SAMSUNG	SM-G9350	/	Mobile Phone
Adapter	SAMSUNG	EP-TA20CBC	/	Adapter

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.
3. The probe size is 92*92*109mm

3. Facilities and Accreditations

3.1. Facilities

The test facility is recognized, certified, or accredited by the following organizations:

- FCC - Registration No.: 645098

SHENZHEN TONGCE TESTING LAB

Designation Number: CN1205

The testing lab has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC - Registration No.: 10668A-1

SHENZHEN TONGCE TESTING LAB

CAB identifier: CN0031

The testing lab has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

3.2. Location

SHENZHEN TONGCE TESTING LAB

Address: TCT Testing Industrial Park Fuqiao 5th Industrial Zone, Fuhai Street, Bao'an District Shenzhen, Guangdong, 518103, People's Republic of China

TEL: +86-755-27673339

3.3. Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Electric Field	± 3.89 dB
2	Magnetic Field	± 4.02 dB
3	Temperature	$\pm 0.5^{\circ}\text{C}$
4	Humidity	$\pm 1.0\%$

4. Test Results and Measurement Data

4.1. Measuring Standard

KDB 680106 D01 RF Exposure Wireless Charging Apps v03

Note: According to April 2018 TCB Workshop, for inductive applications where the primary does not physically attach (clip, lock on) to the client, and it is intended for desktop use, the desktop guidance in KDB 680106 D01 may be applied.

4.2. Requirements

According to the item 5.b of KDB 680106 D01v03:

Inductive wireless power transfer applications with supporting field strength results and meeting all of the following requirements are not required to submit a KDB inquiry for devices approved using SDoC or a PAG for equipment approved using certification to address RF exposure compliance. However, the responsible party is required to keep a copy of the test report in accordance with KDB 865664 D02. A copy of the test report is to be submitted with the application if the device is approved using certification.

- (1) Power transfer frequency is less than 1 MHz.
- (2) Output power from each primary coil is less than or equal to 15 watts.
- (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.
- (4) Client device is placed directly in contact with the transmitter.
- (5) Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).
- (6) The aggregate H-field strengths at 0 cm surrounding the device are demonstrated to be less than 50% of the MPE limit.

Limits For Maximum Permissible Exposure (MPE)

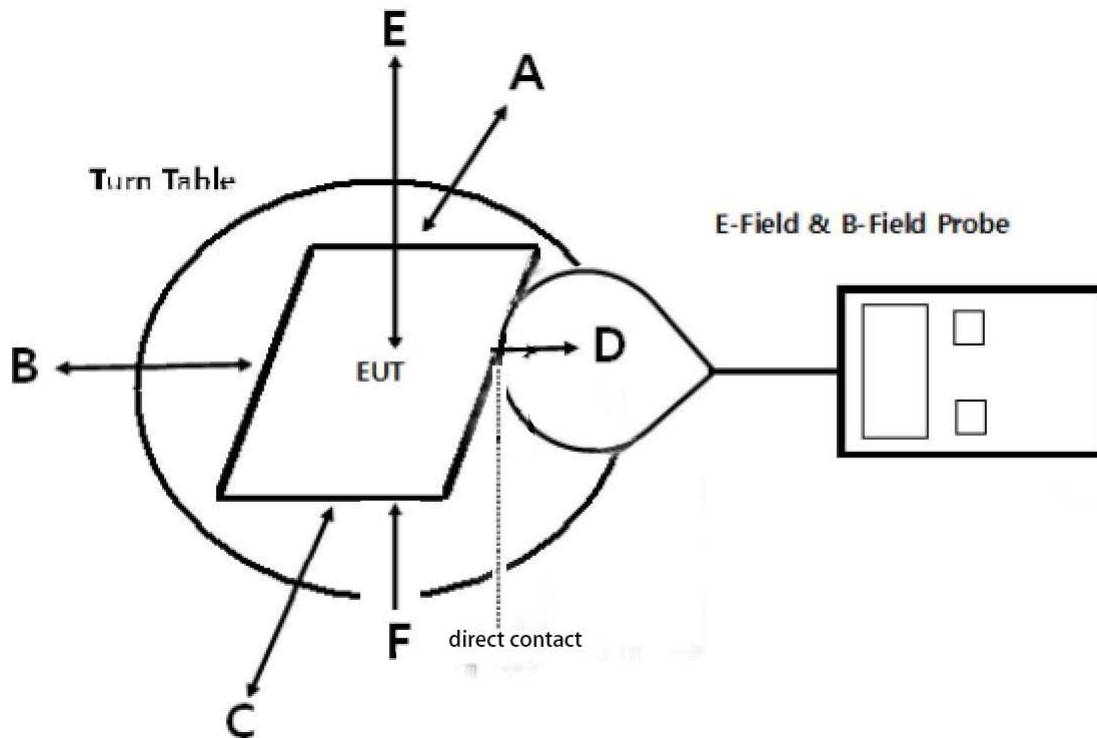
Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f ²)	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	f/300	6
1500-100,000	/	/	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	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).

4.3. Test Setup(worst case)



Note: Measurements should be made from all sides of the primary/client pair, with the 0cm measured from the center of the probe(s) to the edge of the device.

4.4. Test Procedure

- 1) The RF exposure test was performed in anechoic chamber.
- 2) The measurement probe was placed at 0cm surrounding the device
- 3) The highest emission level was recorded and compared with limit as soon as measurement of each points (A, B, C, D, E, F) were completed.
- 4) The EUT was measured according to the dictates of KDB 680106 D01 v03.

Remark;

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

4.5. Test Equipment List

Equipment	Manufacturer	Model No.	Calibration Due
Magnetic field meter	NARDA	EHP-200A	Mar. 07, 2022
Mobile Phone	SAMSUNG	SM-G9350	/
Adapter	SAMSUNG	EP-TA20CBC	/

Note: The probe size is 92*92*109mm

4.6. Test Result

AC mode:

E-Filed Strength 0cm (the worst case) surrounding the device (V/m)

Frequency Range (KHz)	Operation condition	Test Position A	Test Position B	Test Position C	Test Position D	Test Position E	Test Position F	Limits Test (V/m)
115.71 ~ 161.86	Full load	1.59	1.68	1.75	1.80	1.55	1.63	614
115.71 ~ 161.86	Half load	1.32	1.54	1.53	1.56	1.37	1.47	614
115.71 ~ 161.86	No load	1.24	1.26	1.41	1.67	1.28	1.29	614

H-Filed Strength 0 cm (the worst case) surrounding the device (A/m)

Frequency Range (KHz)	Operation condition	Test Position A	Test Position B	Test Position C	Test Position D	Test Position E	Test Position F	Limits Test ((A/m)
115.71 ~ 161.86	Full load	0.228	0.182	0.191	0.192	0.183	0.176	1.63
115.71 ~ 161.86	Half load	0.194	0.177	0.195	0.182	0.198	0.185	1.63
115.71 ~ 161.86	No load	0.197	0.169	0.186	0.174	0.174	0.177	1.63

Internal Battery Mode:

E-Filed Strength 0cm (the worst case) surrounding the device (V/m)

Frequency Range (KHz)	Operation condition	Test Position A	Test Position B	Test Position C	Test Position D	Test Position E	Test Position F	Limits Test (V/m)
115.71 ~ 161.86	Full load	1.51	1.54	1.79	1.85	1.45	1.47	614
115.71 ~ 161.86	Half load	1.28	1.67	1.56	1.53	1.37	1.24	614
115.71 ~ 161.86	No load	1.33	1.26	1.35	1.58	1.24	1.35	614

H-Filed Strength 0 cm (the worst case) surrounding the device (A/m)

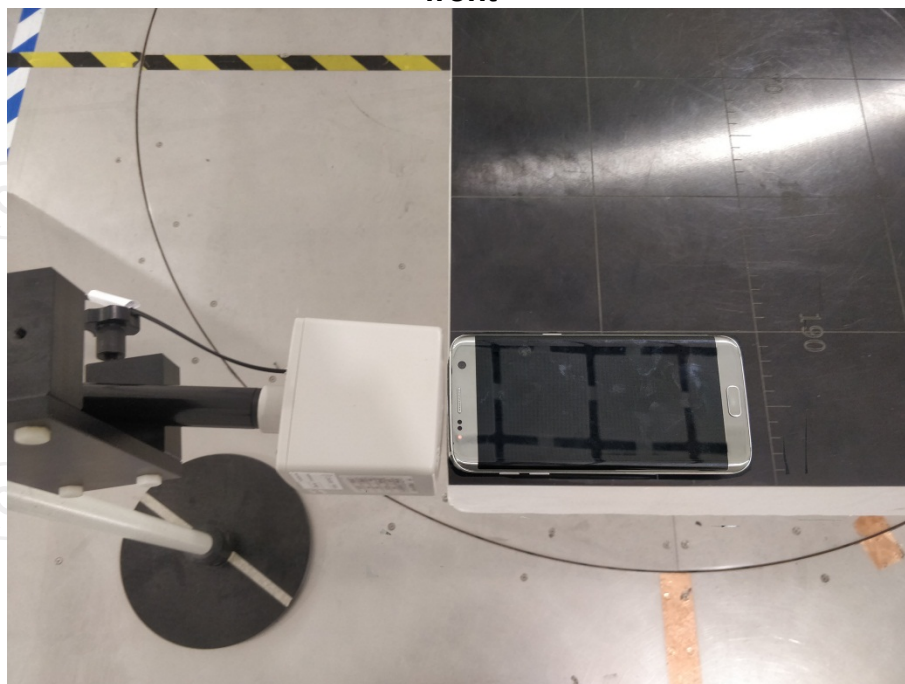
Frequency Range (KHz)	Operation condition	Test Position A	Test Position B	Test Position C	Test Position D	Test Position E	Test Position F	Limits Test ((A/m)
115.71 ~ 161.86	Full load	0.232	0.183	0.184	0.190	0.182	0.189	1.63
115.71 ~ 161.86	Half load	0.188	0.187	0.199	0.182	0.197	0.190	1.63
115.71 ~ 161.86	No load	0.194	0.165	0.181	0.167	0.169	0.165	1.63

According to KDB 680106 D01 v03 section 5, b, satisfy the following conditions

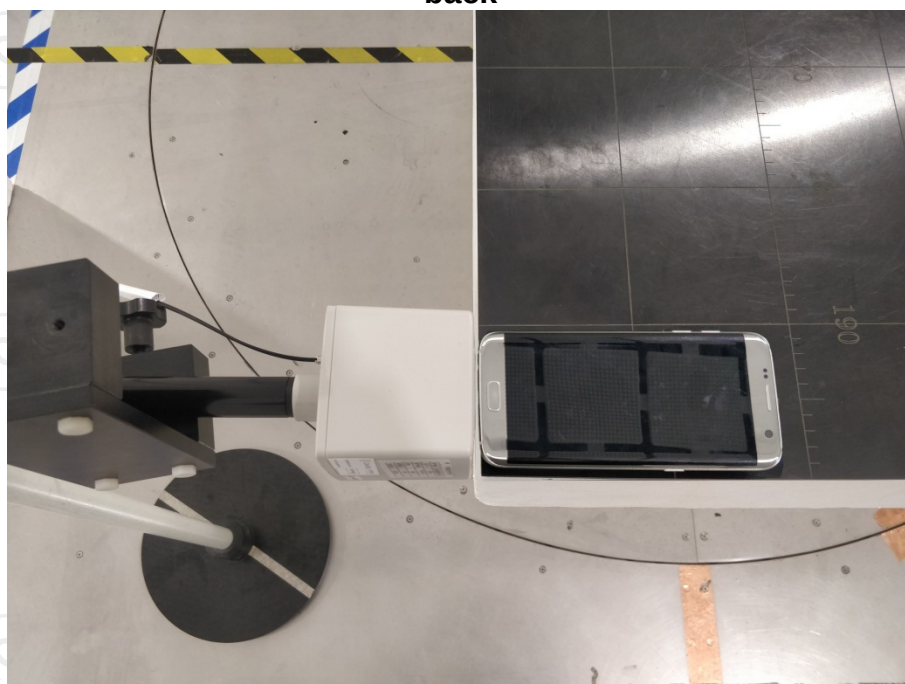
Requirement of KDB 680106 D01	Yes/No	Description
Power transfer frequency is less than 1MHz	Yes	The device operate in the frequency range 115.71kHz – 161.86kHz
Output power from each primary coil is less than or equal to 15 watts	Yes	The maximum output power of the primary coil is 5W.
The transfer system includes only single primary and secondary coils.This includes charging system 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 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).	Yes	Mobile exposure conditions only
The aggregate H-field strengths at 0 cm surrounding the device are demonstrated to be less than 50% of the MPE limit.	Yes	The EUT H-field strengths at 0 cm surrounding the device are demonstrated to be less than 50% of the MPE limit.

4.7. Test Set-up Photo

front



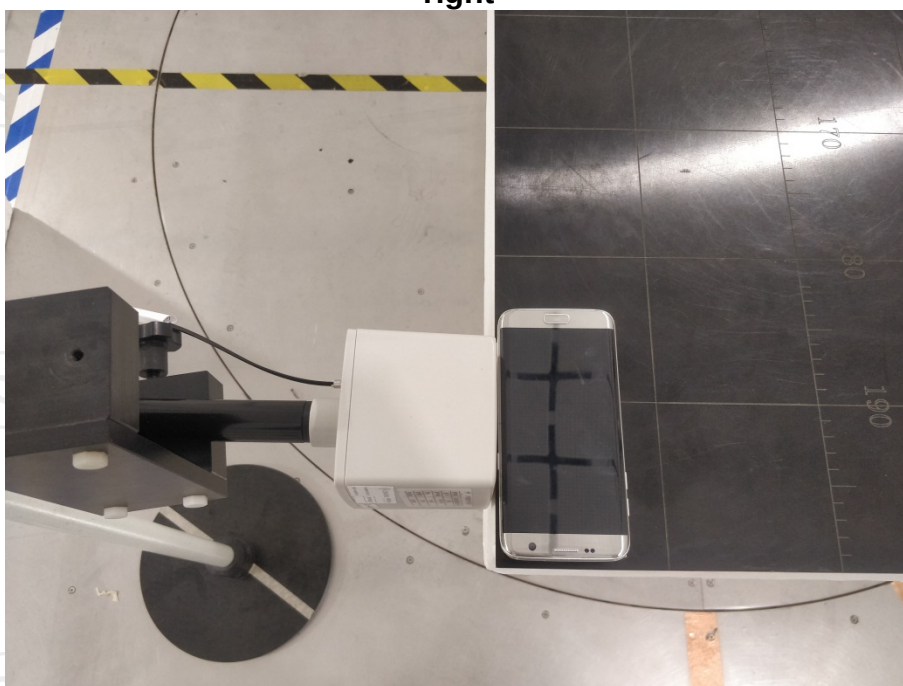
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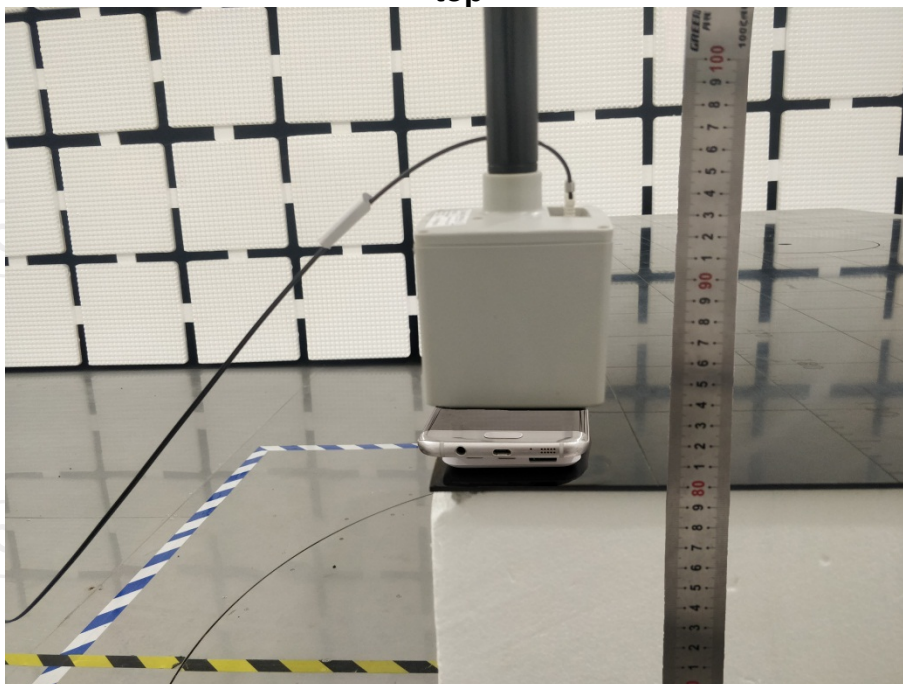
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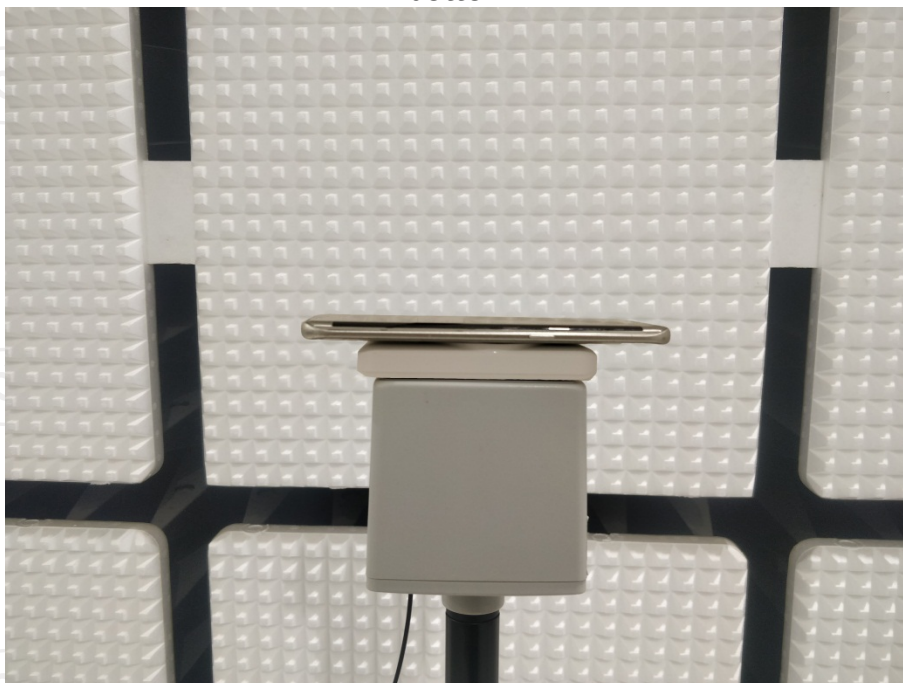
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top



bottom



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