

FCC ID: 2BA8X-JRPBM01

EUT:	Portable Wireless Charger
Trade Mark:	JOYROOM
Model Number:	JR-PBM01
Transmitting mode	Keep the EUT in continuously wireless charging mode
Power supply:	Battery Capacity: 3.85V, 10000mAh, 38.5Wh Type-C Input: 5V---3.0A, 9V---2.0A, 12V---1.5A Lightning1 Input: 5V---2.4A, 9V---2A, 12V---1.5A Lightning2 Input: 5V---2A, 9V---2A, 12V---1.5A Type-C Output: 5V---2.4A, 9V---2.22A, 12V---1.67A Lightning1 Output: 5V---2.4A, 9V---2.22A, 12V---1.67A Wireless charger: 5W, 7.5W, 10W, 15W Multi-port Output: 5V---2.4A(Max.)
Date of Receipt:	Sep. 20, 2023
Test Date:	Sep. 20, 2023 - Sep. 28, 2023
Date of Report:	Sep. 28, 2023

Test Modes:	
Mode1.	Type-C Input+Wireless charger Output Mode(Full Load)
Mode2.	Type-C Input+Wireless charger Output Mode(Half Load)
Mode3.	Type-C Input+Wireless charger Output Mode(No Load)
Mode4.	Lightning1 Input+Wireless charger Output Mode(Full Load)
Mode5.	Lightning1 Input+Wireless charger Output Mode(Half Load)
Mode6.	Lightning1 Input+Wireless charger Output Mode(No Load)
Mode7.	Lightning2 Input+Wireless charger Output Mode(Full Load)
Mode8.	Lightning2 Input+Wireless charger Output Mode(Half Load)
Mode9.	Lightning2 Input+Wireless charger Output Mode(No Load)
Mode10.	Type-C Output+Wireless charger Output Mode(Full Load)
Mode11.	Type-C Output+Wireless charger Output Mode(Half Load)
Mode12.	Type-C Output+Wireless charger Output Mode(No Load)
Mode13.	Lightning1 Output+Wireless charger Output Mode(Full Load)
Mode14.	Lightning1 Output+Wireless charger Output Mode(Half Load)
Mode15.	Lightning1 Output+Wireless charger Output Mode(No Load)
Mode16.	Type-C Output Mode (Full Load)
Mode17.	Type-C Output Mode (Half Load)
Mode18.	Type-C Output Mode (No Load)
Mode19.	Lightning1 Output Mode (Full Load)
Mode20.	Lightning1 Output Mode (Half Load)
Mode21.	Lightning1 Output Mode (No Load)
Mode22.	Wireless charger Output Mode(Full Load)
Mode23.	Wireless charger Output Mode(Half Load)
Mode24.	Wireless charger Output Mode(No Load)

Note: 1. We have evaluated 1%, 50% and 99% battery charging mode, and the worst mode8 (99%) is showed in this report.
2. All modes have been tested, and the report only shows the results of the worst mode(Wireless charger Output Mode).

RF Exposure Evaluation

1 Measuring Standard

KDB 680106 RF Exposure Wireless Charging Apps v03r01

2 Requirements

Three different categories of transmitters are defined by the FCC in OET Bulletin 65. These categories are fixed installation, mobile, and portable and are defined as follows:

- o Fixed Installations: fixed location means that the device, including its antenna, is physically secured at a permanent location and is not able to be easily moved to another location. Additionally, distance to humans from the antenna is maintained to at least 2 meters.
- o Mobile Devices: a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to be generally used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structures and the body of the user or nearby persons. Transmitters designed to be used by consumers or workers that can be easily re-located, such as a wireless modem operating in a laptop computer, are considered mobile devices if they meet the 20 centimeter separation requirement. The FCC rules for evaluating mobile devices for RF compliance are found in 47 CFR §2.1091.
- o Portable Devices: a portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user. Portable device requirements are found in Section 2.1093 of the FCC's Rules (47 CFR§2.1093). The FCC also categorizes the use of the device as based upon the user's awareness and ability to exercise control over his or her exposure. The two categories defined are Occupational/ Controlled Exposure and General Population/Uncontrolled Exposure. These two categories are defined as follows: Occupational/Controlled Exposure: In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means. Awareness of the potential for RF exposure in a workplace or similar environment can be provided through specific training as part of a RF safety program. If appropriate, warning signs and labels can also be used to establish such awareness by providing prominent information on the risk of potential exposure and instructions on methods to minimize such exposure risks.

General Population/Uncontrolled Exposure: The general population / uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity. Warning labels placed on low-power consumer devices such as cellular telephones are not considered sufficient to allow the device to be considered under the occupational/controlled category, and the general population/uncontrolled exposure limits apply to these devices.

According to the item 5 of KDB 680106 v03r01:

Inductive wireless power transfer applications that meet all of the following requirements are excluded from submitting an RF exposure evaluation.

(1) Power transfer frequency is less than 1MHz.	Yes; the device operate in the frequency range from 115 KHz to 205 KHz
(2) Output power from each primary coil is less than or equal to 15 watts.	Yes; the maximum output power of the primary coil is 15W.
(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; the transfer system includes only one primary 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).	No; Portable exposure conditions and Mobile exposure conditions
(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.	Please refer to the result of Magnetic Field Emissions.

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.

Remark: Meet all the above requirements.

Limits

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
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
300-1,500	/	/	f/300	6
1,500-100,000	/	/	5	6

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
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
300-1,500	/	/	f/1500	30
1,500-100,000	/	/	1.0	30

F=frequency in MHz

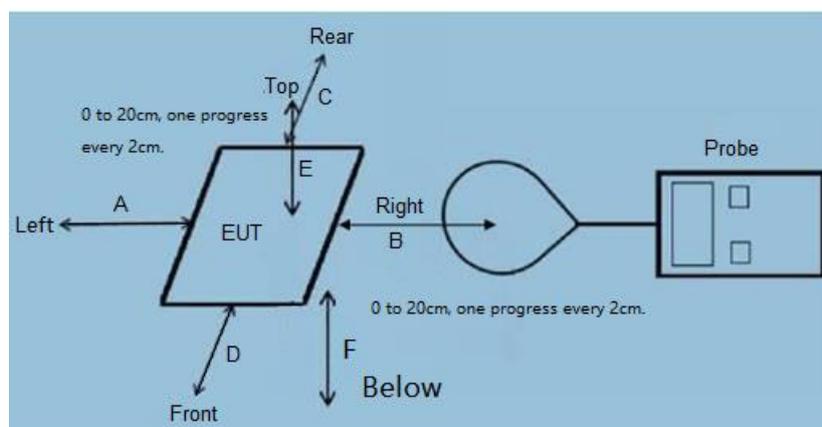
*=Plane-wave equivalent power density

According to FCC 680106 D01 RF Exposure Wireless Charging Apps v03r01 Section 3. RF Exposure Requirements clause 3 the Emission-Limits in the frequency range from 100 KHz to 300 KHz should be assessed versus the limits at 300 KHz in Table 1 of CFR 47 - Section 1.310 as following (measured distance shall be 15cm from the center of the probe to the edge of the device):

	E-Field	*/*	B-Field
Frequency	V/m	A/m	uT
0.3 MHz – 3.0 MHz	614	1.613	2.0
3.0 MHz – 30 MHz	$824/f (=27.5_{30\text{MHz}})$	$2.19/f (=0.073_{30\text{MHz}})$	--

A KDB inquire was required to determine/confirm the applicable limits below 100 KHz.

3 Test Setup



4 Test Procedure

For portable exposure conditions:

- 1) The RF exposure test was performed on 360 degree turn table in anechoic chamber.
- 2) The measurement probe was placed at test distance (0-20 cm, in 2 cm maximum increment) which is between the edge of the charger and the geometric center of probe.
- 3) The highest emission level was recorded and compared with limit as soon as measurement of each point (A, B, C, D, E, F) were completed.
- 4) The EUT were measured according to the dictates of 680106 D01 RF Exposure Wireless Charging Apps v03r01

For mobile exposure conditions:

- 1) The RF exposure test was performed on 360 degree turn table in anechoic chamber.
- 2) The measurement probe was placed at test distance (The test distance of the four directions A, B, C and D is 15cm, and the test distance of the directions top is 20cm) which is between the edge of the charger and the geometric center of probe.
- 3) The highest emission level was recorded and compared with limit as soon as measurement of each point (A, B, C, D, E) were completed.
- 4) The EUT were measured according to the dictates of 680106 D01 RF Exposure Wireless Charging Apps v03r01

5 Description of Support Units

Adapter (Provide by test lab): Manufacturer: XIAOMI Model: AD65G I/P: AC 100-240V 50/60Hz O/P: DC 5V/3A, DC 9V/3A, DC 10V/5A, DC 12V/3A, DC 15V/3A, DC 20V/3.25A	Mobile phone (Provide by test lab): Manufacturer: SAMSUNG Model: Galaxy S21 5G
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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. 24 2023	June. 25 2024
Magnetic field probe 100cm ²	Narda	ELT probe 100cm ²	M0675	June. 24 2023	June. 25 2024
Field Probe	ETS	HI-6105	/	June. 24 2023	June. 25 2024
Laser Data Interface	ETS	HI-6113	/	June. 24 2023	June. 25 2024

7 Test Uncertainty

E-Filed Strength : ±0.08V/m

H-Filed Strength : ±0.02A/m

uT : ±0.01

Note: The field intensity value A/m in the report is converted from uT, and the formula is as follows:

uT to A/m

$$A/m = \frac{\mu T}{1.25}$$

8 Test Result

Portable exposure conditions

Mode	measuring distance (cm)	Measured H-Field Strength Values (ut)					
		Test Position A	Test Position B	Test Position C	Test Position D	Test Position E	Test Position F
No Load	0	0.585	0.661	0.728	0.790	0.758	0.754
Half Load	0	0.749	0.629	0.719	0.634	0.715	0.649
Full Load	0	0.801	0.656	0.638	0.696	0.683	0.579
No Load	2	0.619	0.781	0.621	0.675	0.703	0.749
Half Load	2	0.770	0.698	0.729	0.583	0.788	0.704
Full Load	2	0.620	0.709	0.704	0.776	0.641	0.793
No Load	4	0.638	0.758	0.753	0.683	0.758	0.664
Half Load	4	0.605	0.641	0.710	0.568	0.579	0.596
Full Load	4	0.705	0.783	0.764	0.679	0.636	0.666
No Load	6	0.759	0.705	0.620	0.659	0.593	0.713
Half Load	6	0.703	0.653	0.574	0.630	0.806	0.591
Full Load	6	0.788	0.801	0.644	0.650	0.766	0.690
No Load	8	0.469	0.511	0.536	0.530	0.471	0.533
Half Load	8	0.460	0.510	0.538	0.540	0.495	0.533
Full Load	8	0.548	0.478	0.516	0.500	0.505	0.544
No Load	10	0.525	0.514	0.484	0.476	0.460	0.493
Half Load	10	0.519	0.466	0.449	0.476	0.465	0.494
Full Load	10	0.493	0.473	0.483	0.563	0.441	0.468
No Load	12	0.561	0.533	0.495	0.503	0.560	0.455
Half Load	12	0.506	0.455	0.521	0.525	0.561	0.554
Full Load	12	0.506	0.539	0.544	0.506	0.508	0.526
No Load	14	0.425	0.324	0.358	0.329	0.419	0.371
Half Load	14	0.341	0.394	0.384	0.316	0.364	0.346
Full Load	14	0.418	0.391	0.334	0.333	0.435	0.430
No Load	16	0.344	0.356	0.339	0.348	0.368	0.341
Half Load	16	0.345	0.334	0.354	0.363	0.333	0.420
Full Load	16	0.400	0.433	0.430	0.331	0.413	0.388
No Load	18	0.299	0.208	0.229	0.258	0.245	0.198
Half Load	18	0.213	0.239	0.295	0.260	0.270	0.276
Full Load	18	0.243	0.265	0.304	0.290	0.235	0.206
No Load	20	0.260	0.225	0.238	0.264	0.300	0.209
Half Load	20	0.308	0.254	0.189	0.293	0.244	0.200
Full Load	20	0.271	0.263	0.241	0.236	0.279	0.289

Mode	measuring distance (cm)	Measured H-Field Strength Values (A/m)						FCC H-Field Strength 50% Limits (A/m)	FCC H-Field Strength Limits (A/m)
		Test Position A	Test Position B	Test Position C	Test Position D	Test Position E	Test Position F		
No Load	0	0.468	0.529	0.582	0.632	0.606	0.603	0.815	1.63
Half Load	0	0.599	0.503	0.575	0.507	0.572	0.519	0.815	1.63
Full Load	0	0.641	0.525	0.510	0.557	0.546	0.463	0.815	1.63
No Load	2	0.495	0.625	0.497	0.540	0.562	0.599	0.815	1.63
Half Load	2	0.616	0.558	0.583	0.466	0.630	0.563	0.815	1.63
Full Load	2	0.496	0.567	0.563	0.621	0.513	0.634	0.815	1.63
No Load	4	0.510	0.606	0.602	0.546	0.606	0.531	0.815	1.63
Half Load	4	0.484	0.513	0.568	0.454	0.463	0.477	0.815	1.63
Full Load	4	0.564	0.626	0.611	0.543	0.509	0.533	0.815	1.63
No Load	6	0.607	0.564	0.496	0.527	0.474	0.570	0.815	1.63
Half Load	6	0.562	0.522	0.459	0.504	0.645	0.473	0.815	1.63
Full Load	6	0.630	0.641	0.515	0.520	0.613	0.552	0.815	1.63
No Load	8	0.375	0.409	0.429	0.424	0.377	0.426	0.815	1.63
Half Load	8	0.368	0.408	0.430	0.432	0.396	0.426	0.815	1.63
Full Load	8	0.438	0.382	0.413	0.400	0.404	0.435	0.815	1.63
No Load	10	0.420	0.411	0.387	0.381	0.368	0.394	0.815	1.63
Half Load	10	0.415	0.373	0.359	0.381	0.372	0.395	0.815	1.63
Full Load	10	0.394	0.378	0.386	0.450	0.353	0.374	0.815	1.63
No Load	12	0.449	0.426	0.396	0.402	0.448	0.364	0.815	1.63
Half Load	12	0.405	0.364	0.417	0.420	0.449	0.443	0.815	1.63
Full Load	12	0.405	0.431	0.435	0.405	0.406	0.421	0.815	1.63
No Load	14	0.340	0.259	0.286	0.263	0.335	0.297	0.815	1.63
Half Load	14	0.273	0.315	0.307	0.253	0.291	0.277	0.815	1.63
Full Load	14	0.334	0.313	0.267	0.266	0.348	0.344	0.815	1.63
No Load	16	0.275	0.285	0.271	0.278	0.294	0.273	0.815	1.63
Half Load	16	0.276	0.267	0.283	0.290	0.266	0.336	0.815	1.63
Full Load	16	0.320	0.346	0.344	0.265	0.330	0.310	0.815	1.63
No Load	18	0.239	0.166	0.183	0.206	0.196	0.158	0.815	1.63
Half Load	18	0.170	0.191	0.236	0.208	0.216	0.221	0.815	1.63
Full Load	18	0.194	0.212	0.243	0.232	0.188	0.165	0.815	1.63
No Load	20	0.208	0.180	0.190	0.211	0.240	0.167	0.815	1.63
Half Load	20	0.246	0.203	0.151	0.234	0.195	0.160	0.815	1.63
Full Load	20	0.217	0.210	0.193	0.189	0.223	0.231	0.815	1.63

Mobile exposure conditions

Mode	measuring distance (cm)	Measured H-Field Strength Values (ut)				
		Test Position A	Test Position B	Test Position C	Test Position D	Test Position E
No Load	15	0.463	0.752	0.769	0.637	/
Half Load	15	0.527	0.596	0.777	0.627	/
Full Load	15	0.638	0.715	0.685	0.709	/
No Load	20	/	/	/	/	0.749
Half Load	20	/	/	/	/	0.687
Full Load	20	/	/	/	/	0.723

Mode	measuring distance (cm)	Measured H-Field Strength Values (A/m)					FCC H-Field Strength 50% Limits (A/m)	FCC H-Field Strength Limits (A/m)
		Test Position A	Test Position B	Test Position C	Test Position D	Test Position E		
No Load	15	0.370	0.602	0.615	0.510	/	0.815	1.63
Half Load	15	0.422	0.477	0.622	0.502	/	0.815	1.63
Full Load	15	0.510	0.572	0.548	0.567	/	0.815	1.63
No Load	20	/	/	/	/	0.599	0.815	1.63
Half Load	20	/	/	/	/	0.550	0.815	1.63
Full Load	20	/	/	/	/	0.578	0.815	1.63

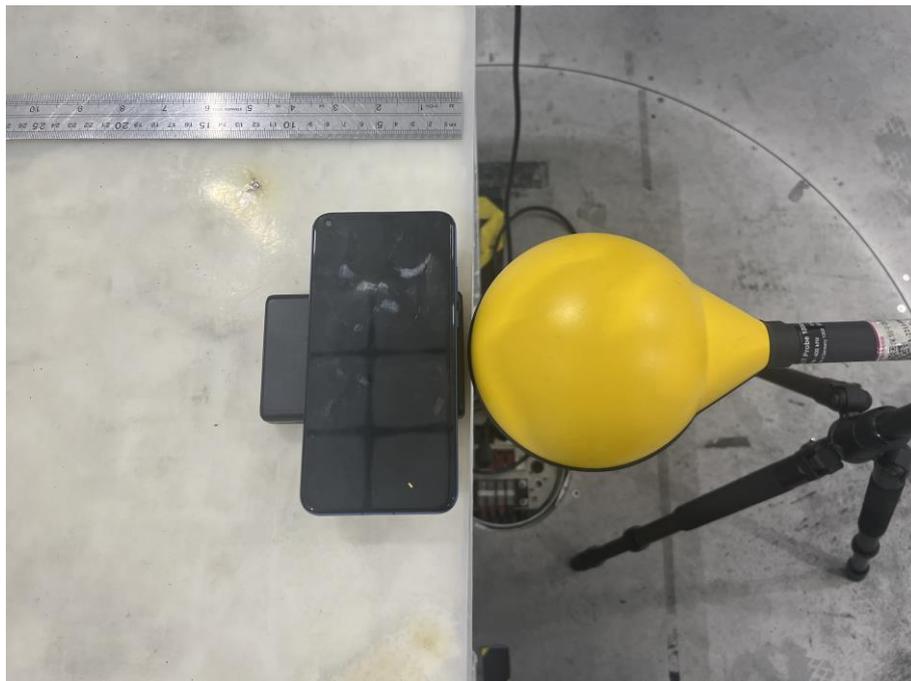
9 Test Set-up Photo

Portable exposure conditions(0cm)

Front



Left



Right



Rear



Top



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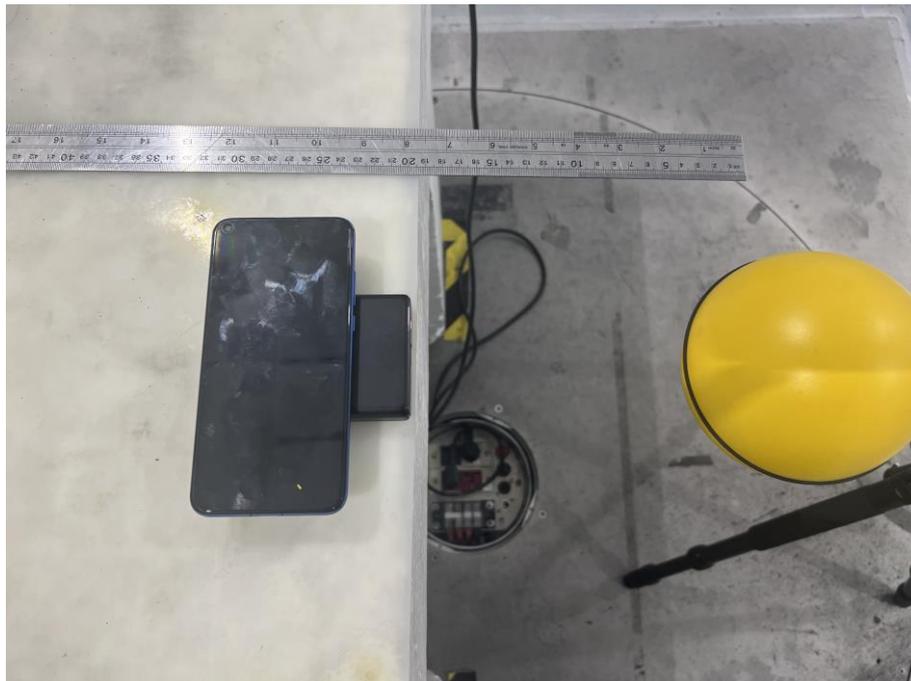


Portable exposure conditions(20cm)

Left



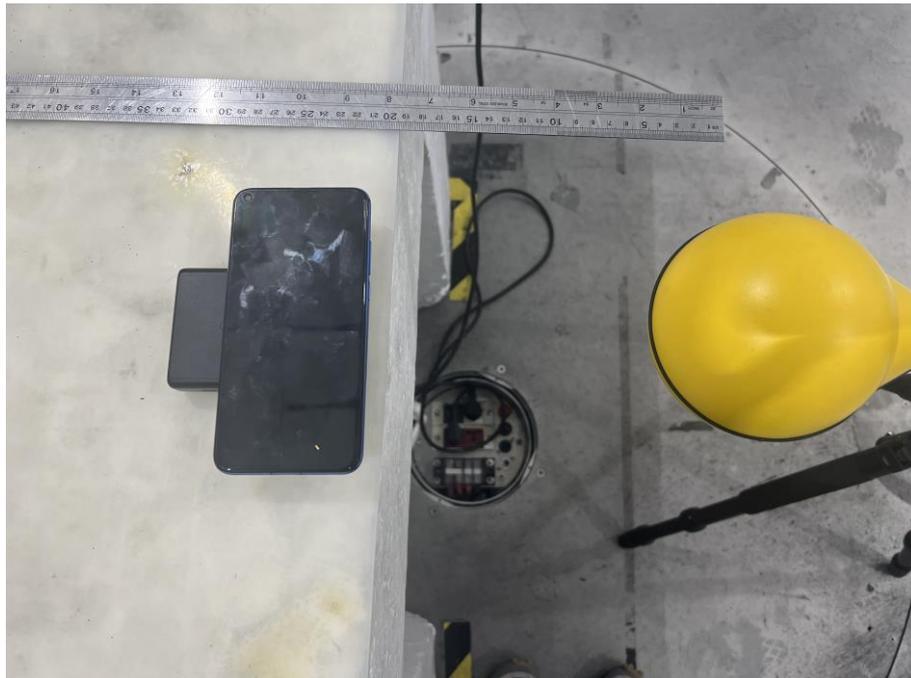
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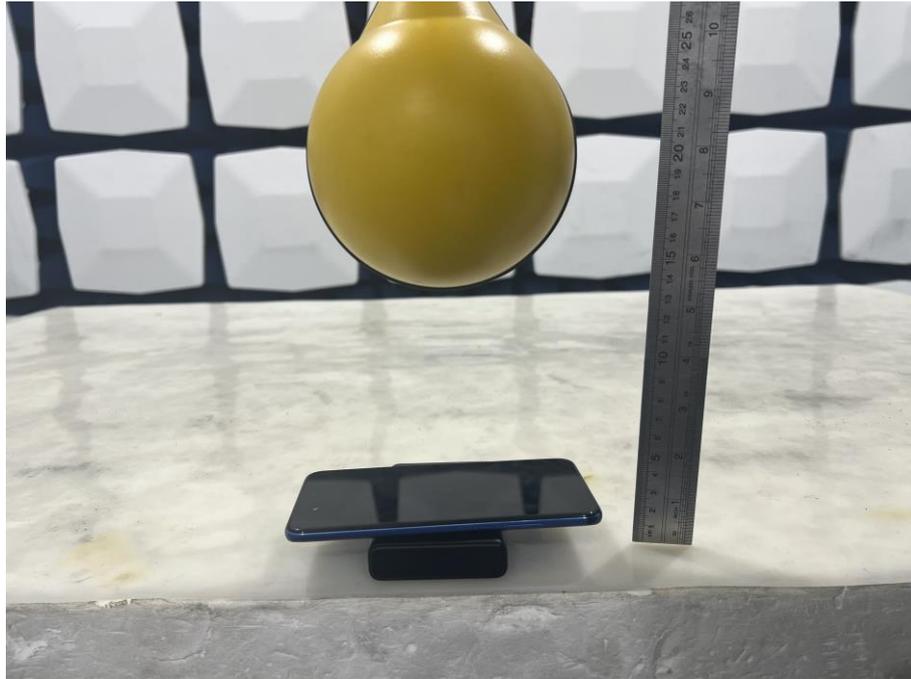
Rear



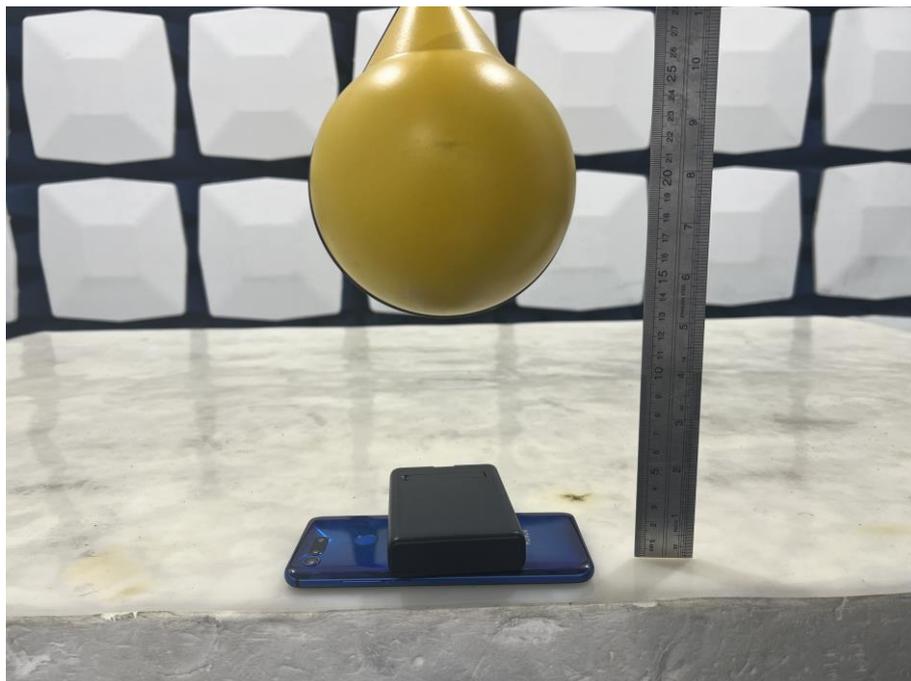
Right



Top

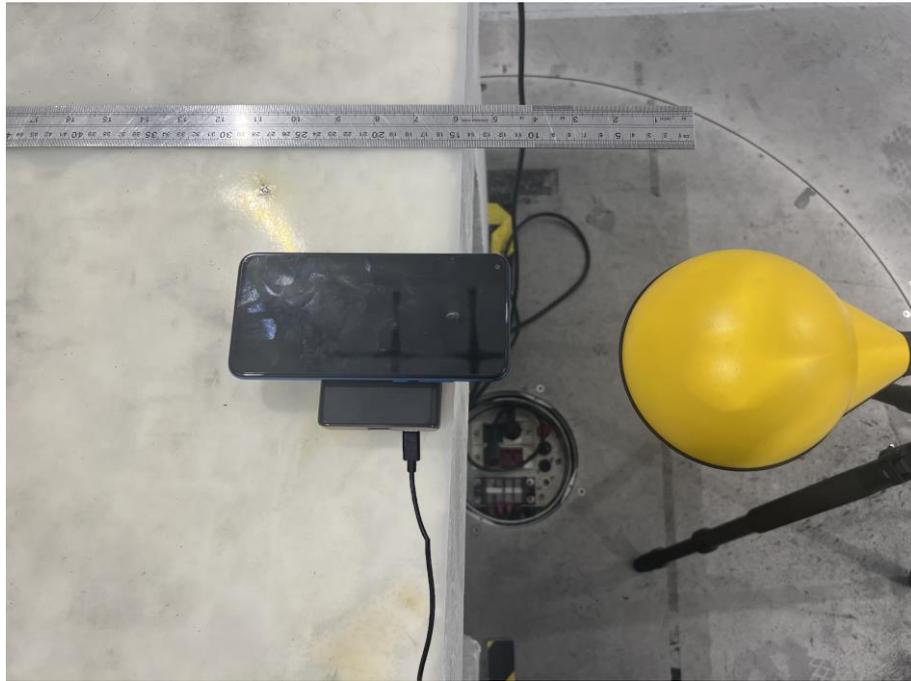


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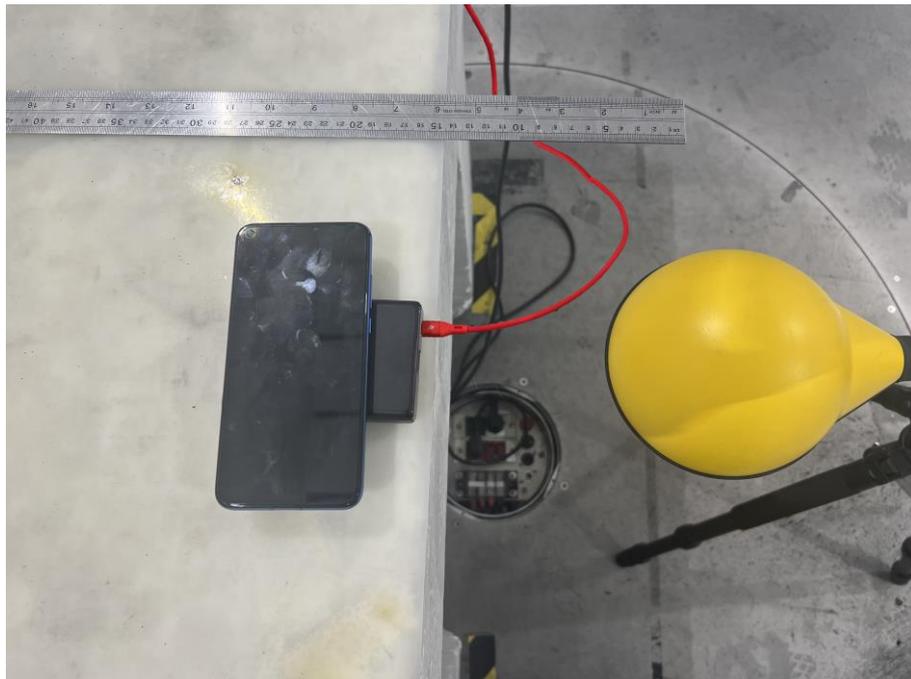


Mobile exposure conditions (15cm)

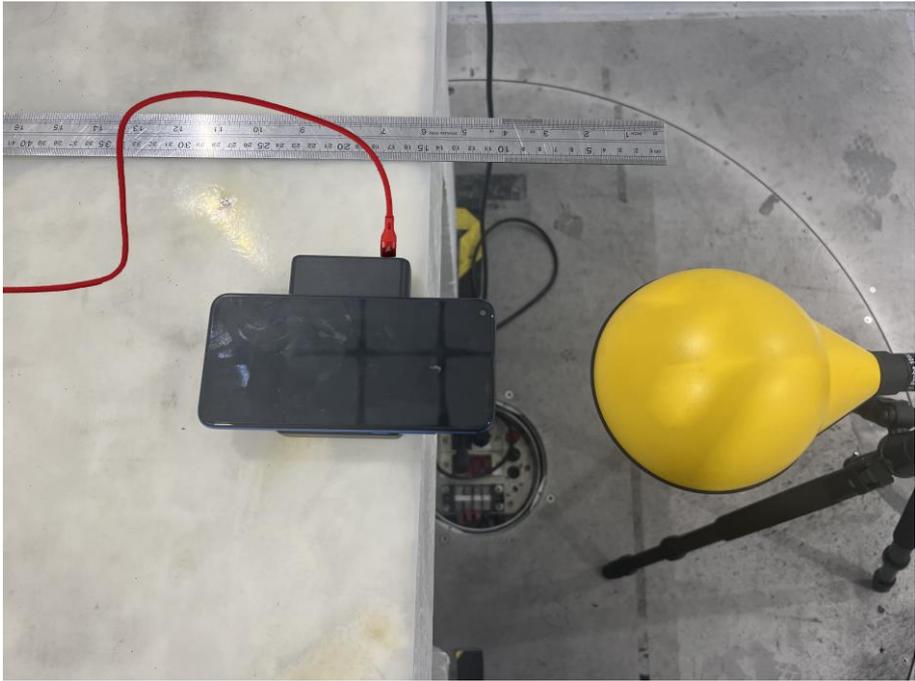
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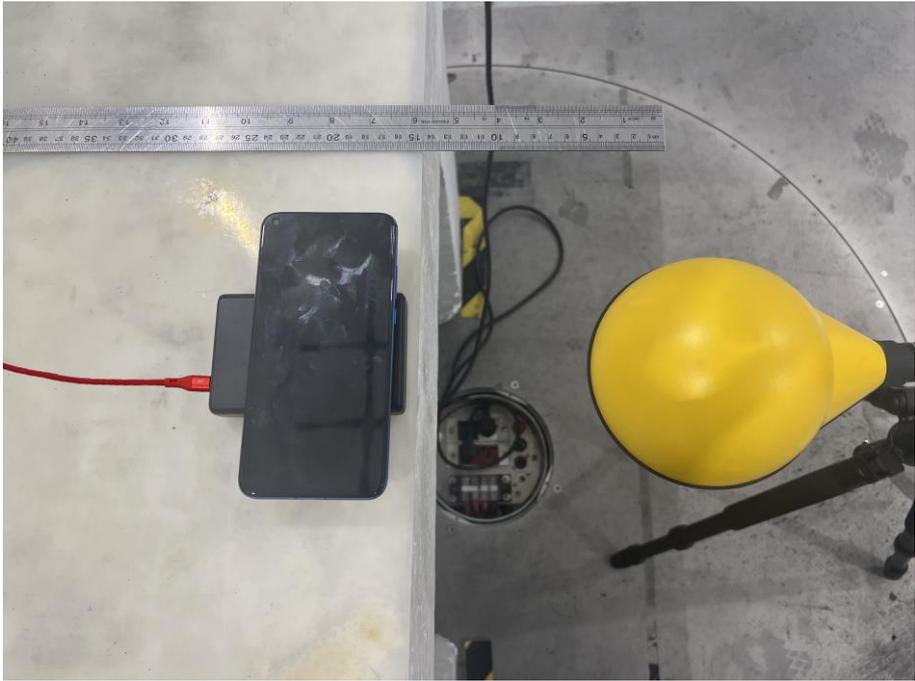
Front



Rear



Right



Mobile exposure conditions (20cm)

Top

