



TEST REPORT

Product Name : Qi2 3 in 1 Foldable wireless charger
Brand Name : N/A
Model : TKWC-052
Series Model : TKWC-052Q,TKWC-052C,27676
FCC ID : 2AV8L-TKWC-052
Applicant : **TANKYA DEVELOPING CO., LIMITED**
Address : 6F, B Building of Tengyao Technology Park, 2nd Gushu Road, Xixiang, Baoan, Shenzhen, China
Manufacturer : **Shenzhen Powerqi Technology Co.,Ltd.**
Address : Room 901, Building 5, 10th Industrial Zone, Tianliao Community, Yutang Street, Guangming District, Shenzhen, 518127, Guangdong, China
Standard(s) : FCC CFR 47 PART 1, § 1.1310
KDB 680106 D01 Wireless Power Transfer v04
Date of Receipt : Aug.02, 2024
Date of Test : Aug.02, 2024~ Aug.07, 2024
Issued Date : Aug.07, 2024

Issued By: **Guangdong Asia Hongke Test Technology Limited**
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Reviewed by: 
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Approved by: 
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Note: This device has been tested and found to comply with the standard(s) listed, this test report merely corresponds to the test sample. It is not permitted to copy extracts of these test result without the written permission of the test laboratory. This report shall not be reproduced except in full, without the written approval of Guangdong Asia Hongke Test Technology Limited. If there is a need to alter or revise this document, the right belongs to Guangdong Asia Hongke Test Technology Limited, and it should give a prior written notice of the revision document. This test report must not be used by the client to claim product endorsement.



Report Revise Record

Report Version	Issued Date	Notes
M1	Aug.07, 2024	Initial Release

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1 GENGGENERAL INFORMATION

1.1 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 kPa

1.2 General Description of EUT

Product Name:	Qi2 3 in 1 Foldable wireless charger
Model/Type reference:	TKWC-052
Power Supply:	Input: DC12V=3A,15V=2.33A Output1: 5W, 7.5W, 10W, 15W(Phone) Output2: 2.5W(Apple Watch) Output3: 5W(AirPods)
Hardware version:	V10
Software version:	V1.0
Sample(s) Status:	AiTSZ-240802003-01(Normal sample) AiTSZ-240802003-02(Engineer sample)
Wireless Charger:	
Operation frequency:	Coil1: For Phone: 113kHz-205kHz, 360KHZ Coil2: For Earphone: 113kHz-205kHz Coil3: Watch: 300kHz-350kHz
Modulation Technology:	ASK
Antenna Type:	Loop coil Antenna
Antenna gain:	0dBi
Remark: The above DUT's information was declared by manufacturer. For more detailed features description, please refer to the manufacturer's specifications or the User's Manual.	

1.3 Test Facility

Test Laboratory:

Guangdong Asia Hongke Test Technology Limited

B1/F, Building 11, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

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

FCC-Registration No.: 251906 Designation Number: CN1376

Guangdong Asia Hongke Test Technology Limited has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

IC —Registration No.: 31737 CAB identifier: CN0165

The 3m Semi-anechoic chamber of Guangdong Asia Hongke Test Technology Limited has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 31737

A2LA-Lab Cert. No.: 7133.01

Guangdong Asia Hongke Test Technology Limited has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

1.4 Measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report according to CISPR 16 - 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the Guangdong Asia Hongke Test Technology Limited’s quality system according to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Asia Hongke laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Magnetic field expanded uncertainty	3KHz-10MHz	3.58dB	(1)
Electric Field expanded uncertainty	3KHz-10MHz	2.41dB	(1)

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

2.1 Description of the test mode

Equipment under test was operated during the measurement under the following conditions:

Charging and communication mode

Test Modes:		
Mode 1	AC Adapter + EUT + Earphone + Watch + Phone (Battery Status: < 1%)	Record
Mode 2	AC Adapter + EUT + Earphone + Watch + Phone (Battery Status: < 50%)	Record
Mode 3	AC Adapter + EUT + Earphone + Watch + Phone (Battery Status: < 99%)	Record
Mode 4	AC Adapter + EUT + Earphone+ Phone (Battery Status: < 1%)	Pre-tested
Mode 5	AC Adapter + EUT + Earphone+ Phone (Battery Status: < 50%)	Pre-tested
Mode 6	AC Adapter + EUT + Earphone+ Phone (Battery Status: < 99%)	Pre-tested
Mode 7	AC Adapter + EUT + Watch + Phone (Battery Status: < 1%)	Pre-tested
Mode 8	AC Adapter + EUT + Watch + Phone (Battery Status: < 50%)	Pre-tested
Mode 9	AC Adapter + EUT + Watch + Phone (Battery Status: < 99%)	Pre-tested
Mode 11	AC Adapter + EUT + Earphone + Watch	Pre-tested
Mode 12	AC Adapter + EUT + Earphone	Pre-tested
Mode 13	AC Adapter + EUT + Watch	Pre-tested
Mode 14	AC Adapter + EUT+ Phone (Battery Status: < 1%)	Pre-tested
Mode 15	AC Adapter + EUT+ Phone (Battery Status: < 50%)	Pre-tested
Mode 16	AC Adapter + EUT+ Phone (Battery Status: < 99%)	Pre-tested
Mode 17	Stand-by mode.	Pre-tested

Note: All test modes were pre-tested, but we only recorded the worst case in this report.

2.2 Special Accessories

Follow auxiliary equipment(s) test with EUT that provided by the manufacturer or laboratory is listed as follow:

Description	Manufacturer	Model	Serial No.	Provided by	Other
Adapter	HNT	HNT-QC530	/	Test lab	/
Phone	YBZ	15W	/	Test lab	/
Phone	Apple	iphone 14	/	Test lab	15W
Watch	Apple	S6	/	Test lab	/
Earphone	PocBuds	K6	/	Test lab	/

2.3 Equipment List for the Test

No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	Magnetic Amplitude and Gradient Probe System	SPEAG	MAGPy-8H3D+E3D V2.6 & MAGPy-DAS V2.6	3107 & 3097	2024.03.15	2025.03.14

3 TEST CONDITIONS AND RESULTS

3.1 Applicable 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 §2.1091 RF exposure is calculated.

According KDB 680106 D01 RF Exposure Wireless Charging App v04

3.2 Limit

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)*	6
30 – 300	61.4	0.163	1.0	6
300 – 1500	/	/	f/300	6
1500 – 100,000	/	/	5	6

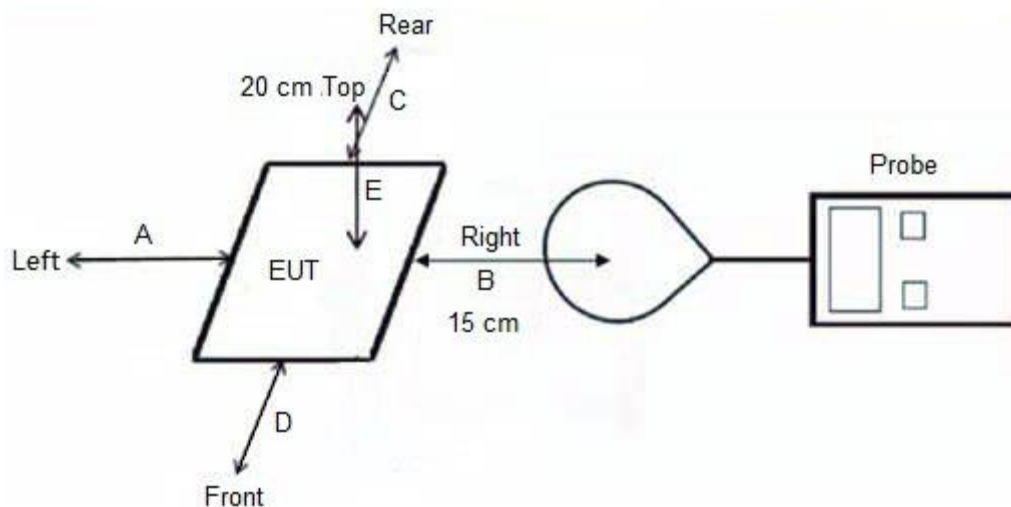
Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	30
3.0 – 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	/	/	1.0	30

F=frequency in MHz

*=Plane-wave equivalent power density

3.3 Test Setup



Note: A, B, C, D, E, F for six surfaces of the product.

3.4 Measurement Procedure

- a) The RF exposure test was performed on 360 degree turn table in anechoic chamber.
- b) The measurement probe was placed at test distance (15 cm from all sides and 20 cm from the top) which is between the edge of the charger and the geometric centre of probe.
- c) The turn table was rotated 360d degree to search of highest strength.
- d) The highest emission level was recorded and compared with limit as soon as measurement of each points (A, B, C, D, E) were completed.
- e) The EUT were measured according to the dictates of KDB 680106 D01 RF Exposure Wireless Charging App v04.

3.5 Test Result of E and H field Strength

MPE_Coil 1_Phone@113-205KHz

Test distance	Battery levels	Probe from EUT Side	E-field (V/m)	H-field (A/m)
20cm	< 1%	Top	12.19	0.51
15cm	< 1%	Top	12.17	0.54
15cm	< 1%	Left	12.22	0.45
15cm	< 1%	Right	11.70	0.40
15cm	< 1%	Front	12.45	0.64
15cm	< 1%	Rear	12.27	0.50
Limit			614	1.63
Margin Limit (%)			2.03%	39.26%

MPE_Coil 1_Phone@113-205KHz

Test distance	Battery levels	Probe from EUT Side	E-field (V/m)	H-field (A/m)
20cm	< 50%	Top	11.37	0.45
15cm	< 50%	Top	10.07	0.45
15cm	< 50%	Left	11.05	0.44
15cm	< 50%	Right	10.96	0.51
15cm	< 50%	Front	10.98	0.47
15cm	< 50%	Rear	11.05	0.49
Limit			614	1.63
Margin Limit (%)			1.85%	31.29%

MPE_Coil 1_Phone@113-205KHz

Test distance	Battery levels	Probe from EUT Side	E-field (V/m)	H-field (A/m)
20cm	< 99%	Top	11.29	0.31
15cm	< 99%	Top	10.58	0.30
15cm	< 99%	Left	10.89	0.39
15cm	< 99%	Right	10.69	0.36
15cm	< 99%	Front	11.00	0.29
15cm	< 99%	Rear	11.10	0.43
Limit			614	1.63
Margin Limit (%)			1.84%	26.38%

MPE_Coil 1_Phone@360KHz

Test distance	Battery levels	Probe from EUT Side	E-field (V/m)	H-field (A/m)
20cm	< 1%	Top	12.11	0.48
15cm	< 1%	Top	12.15	0.52
15cm	< 1%	Left	12.17	0.44
15cm	< 1%	Right	11.63	0.36
15cm	< 1%	Front	12.42	0.61
15cm	< 1%	Rear	12.21	0.48
Limit			614	1.63
Margin Limit (%)			2.02%	37.42%

MPE_Coil 1_Phone@360KHz

Test distance	Battery levels	Probe from EUT Side	E-field (V/m)	H-field (A/m)
20cm	< 50%	Top	11.33	0.44
15cm	< 50%	Top	10.05	0.42
15cm	< 50%	Left	11.01	0.43
15cm	< 50%	Right	10.92	0.50
15cm	< 50%	Front	10.93	0.44
15cm	< 50%	Rear	11.04	0.45
Limit			614	1.63
Margin Limit (%)			1.85%	30.67%

MPE_Coil 1_Phone@360KHz

Test distance	Battery levels	Probe from EUT Side	E-field (V/m)	H-field (A/m)
20cm	< 99%	Top	11.25	0.29
15cm	< 99%	Top	10.55	0.27
15cm	< 99%	Left	10.87	0.25
15cm	< 99%	Right	10.62	0.33
15cm	< 99%	Front	10.95	0.24
15cm	< 99%	Rear	11.05	0.42
Limit			614	1.63
Margin Limit (%)			1.83%	25.77%

MPE_Coil 2_Earphone

Test distance	Battery levels	Probe from EUT Side	E-field (V/m)	H-field (A/m)
20cm	< 1%	Top	10.61	0.37
15cm	< 1%	Top	10.68	0.30
15cm	< 1%	Left	10.45	0.42
15cm	< 1%	Right	10.87	0.39
15cm	< 1%	Front	10.58	0.43
15cm	< 1%	Rear	10.63	0.27
Limit			614	1.63
Margin Limit (%)			1.77%	26.38%

MPE_Coil 2_Earphone

Test distance	Battery levels	Probe from EUT Side	E-field (V/m)	H-field (A/m)
20cm	< 50%	Top	9.95	0.28
15cm	< 50%	Top	9.33	0.28
15cm	< 50%	Left	9.36	0.34
15cm	< 50%	Right	9.57	0.16
15cm	< 50%	Front	9.48	0.22
15cm	< 50%	Rear	9.38	0.23
Limit			614	1.63
Margin Limit (%)			1.62%	20.86%

MPE_Coil 2_Earphone

Test distance	Battery levels	Probe from EUT Side	E-field (V/m)	H-field (A/m)
20cm	< 99%	Top	9.26	0.21
15cm	< 99%	Top	8.39	0.17
15cm	< 99%	Left	8.73	0.08
15cm	< 99%	Right	8.36	0.26
15cm	< 99%	Front	8.57	0.19
15cm	< 99%	Rear	9.15	0.20
Limit			614	1.63
Margin Limit (%)			1.51%	15.95%

MPE_Coil 3_Watch

Test distance	Battery levels	Probe from EUT Side	E-field (V/m)	H-field (A/m)
20cm	< 1%	Top	10.18	0.33
15cm	< 1%	Top	10.36	0.37
15cm	< 1%	Left	10.02	0.29
15cm	< 1%	Right	10.23	0.37
15cm	< 1%	Front	9.84	0.32
15cm	< 1%	Rear	9.98	0.29
Limit			614	1.63
Margin Limit (%)			1.69%	22.70%

MPE_Coil 3_Watch

Test distance	Battery levels	Probe from EUT Side	E-field (V/m)	H-field (A/m)
20cm	< 50%	Top	9.66	0.26
15cm	< 50%	Top	8.46	0.19
15cm	< 50%	Left	9.20	0.19
15cm	< 50%	Right	8.89	0.30
15cm	< 50%	Front	9.39	0.15
15cm	< 50%	Rear	9.02	0.12
Limit			614	1.63
Margin Limit (%)			1.57%	18.40%

MPE_Coil 3_Watch

Test distance	Battery levels	Probe from EUT Side	E-field (V/m)	H-field (A/m)
20cm	< 99%	Top	8.41	0.07
15cm	< 99%	Top	7.28	0.09
15cm	< 99%	Left	7.69	0.06
15cm	< 99%	Right	8.31	0.04
15cm	< 99%	Front	8.02	0.14
15cm	< 99%	Rear	8.15	0.17
Limit			614	1.63
Margin Limit (%)			1.37%	10.43%

Note: All test modes were pre-tested, but we only recorded the worst case in this report.

Total exposure

MPE-based total exposure ratio (Worst case):

E-field:

$$\text{Coil 1+Coil 2+Coil 3} = 0.0203 + 0.0177+0.0169= 0.0549 < 1$$

H-field:

$$\text{Coil 1+Coil 2+Coil 3} = 0.3926 + 0.2638+0.2270 = 0.8834 < 1$$

3.6 Equipment Approval Considerations

The EUT does comply with KDB 680106 D01 as follow table.

Requirements of KDB 680106 D01	Yes / No	Description
The power transfer frequency is below 1 MHz.	Yes	The device operate in the frequency range is below 1 MHz.
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 coil is 15W
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.
Only § 2.1091-Mobile exposure conditions apply (i.e., this provision does not cover § 2.1093-Portable exposure conditions).	Yes	Mobile exposure conditions only.
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,	Yes	The E-field and H-field strengths at and beyond 20 cm surrounding the device from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.
For systems with more than one radiating structure, the conditions specified in (5) must be met when the system is fully loaded.	Yes	The configure the system is fully loaded.

3.7 Conclusion

The detected emissions with a distance of 15cm surrounding the device and 20 cm above the top surface of the device are below the FCC E-Field Strength & H-Field Strength limits; and comply with the requirements of FCC KDB 680106 D01.

4 Test Setup Photographs of EUT

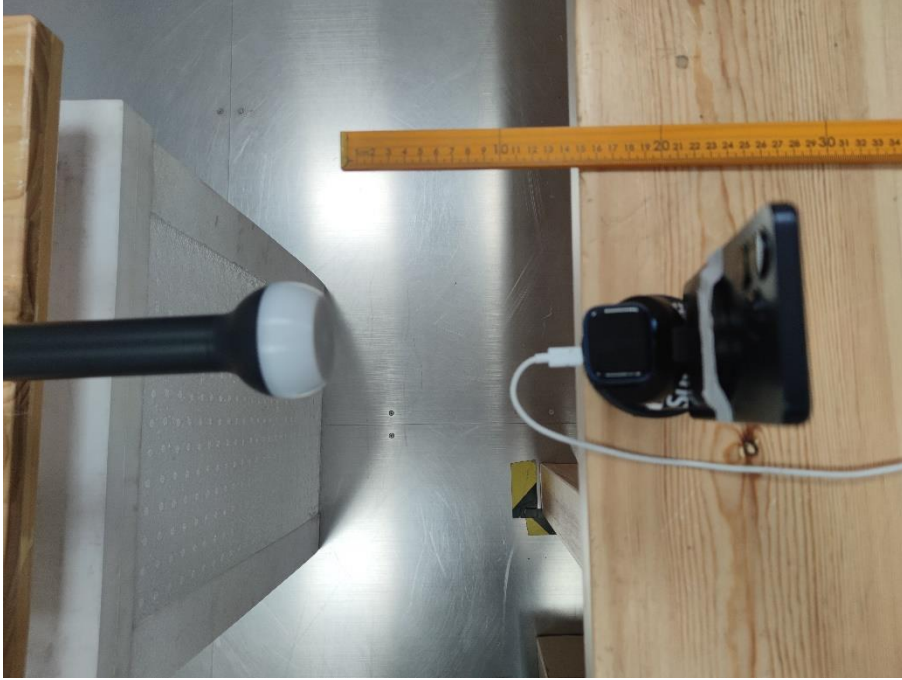
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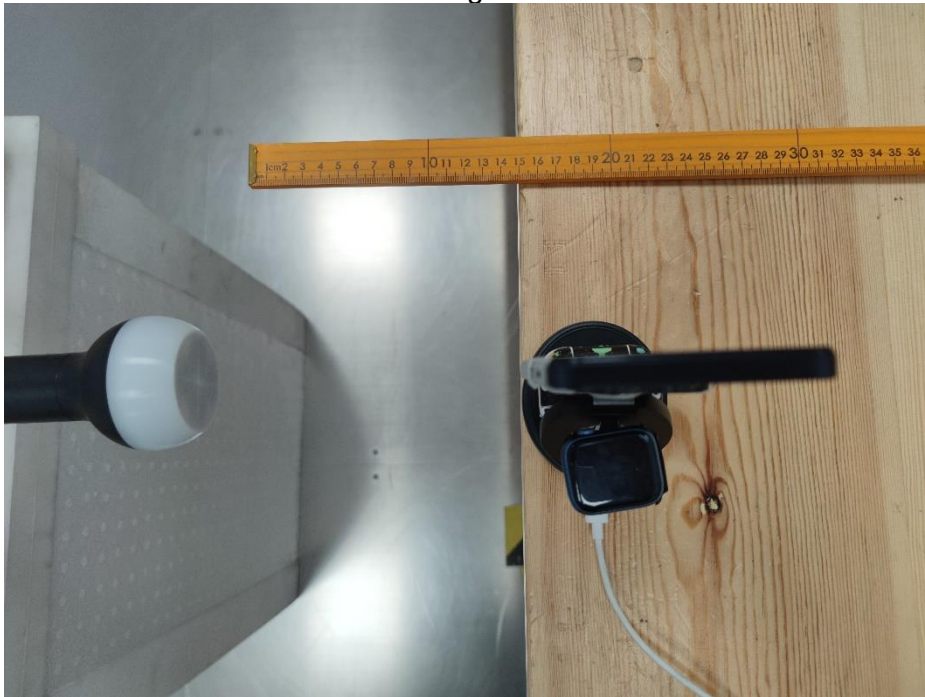
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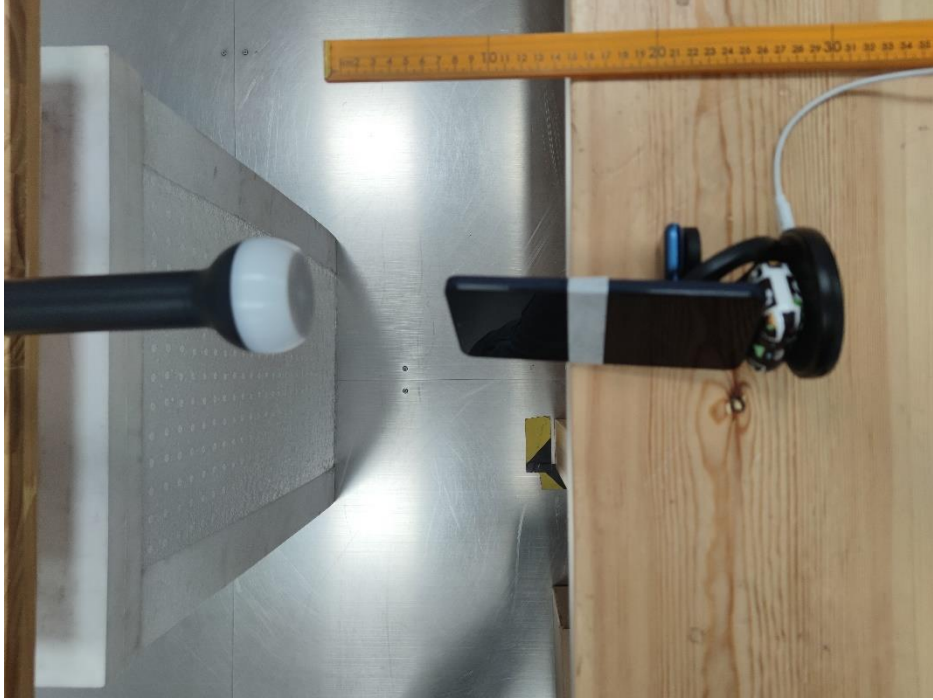
Rear



Right



Top



***** End of Report *****