

RF EXPOSURE Test Report

Product: MagSafe Power Bank with Built-in Cable
Trade Mark: ESORUN
Model Number: C1020W
FCC ID: 2AP2N-C1020

Prepared for

Shenzhen Esorun Technology Co.,LTD
Room 226, Building A, B, C, Zone B, Yuanfen Industrial Zone, Taoyuan
Community, Dalang Street, Longhua District, Shenzhen

Prepared by

Shenzhen HongBiao Certification& Testing Co., Ltd
Room 102, 201, Building 2, Yuanwanggu RFID Industrial Park, Tongguan
Road, Tianliao Community, Yutang Street, Guangming District, Shenzhen,
China
Tel.: +86-755-2998 9321 Fax.: +86-755-2998 5110
Website: <http://www.sz-hongbiao.com>

Table of Contents

1	GENERAL DESCRIPTION	5
1.1	DESCRIPTION OF EUT	5
1.2	TEST MODE	5
1.3	TEST SETUP	5
1.4	ANCILLARY EQUIPMENT	6
2	TEST FACILITIES AND ACCREDITATIONS	7
2.1	TEST LABORATORY	7
2.2	ENVIRONMENTAL CONDITIONS	7
2.3	MEASUREMENT UNCERTAINTY	7
2.4	TEST SOFTWARE	7
3	LIST OF TEST EQUIPMENT	8
4	RF EXPOSURE	9
4.1	MAXIMUM PERMISSIBLE EXPOSURE	9
4.1.1.	<i>Limit.....</i>	<i>9</i>
4.1.2.	<i>Test Procedures.....</i>	<i>9</i>
4.1.3.	<i>Test Setup.....</i>	<i>9</i>
4.1.4.	<i>Equipment Approval Considerations item 5 b) of KDB 680106 D01 Wireless.....</i>	<i>10</i>
4.1.5.	<i>Test Result.....</i>	<i>10</i>
5	PHOTOGRAPHS OF THE TEST SETUP	19

TEST RESULT CERTIFICATION

Applicant's Name.....: Shenzhen Esorun Technology Co.,LTD
Room 226, Building A, B, C, Zone B, Yuanfen Industrial Zone,
Address.....: Taoyuan Community, Dalang Street, Longhua District,
Shenzhen
Manufacturer's Name.....: Shenzhen Esorun Technology Co.,LTD
Room 226, Building A, B, C, Zone B, Yuanfen Industrial Zone,
Address.....: Taoyuan Community, Dalang Street, Longhua District,
Shenzhen

Product description

Product name: MagSafe Power Bank with Built-in Cable
Model Number: C1020W

Standards.....: FCC CFR 47 PART 1 , 1.1310

Test procedure.....: KDB 680106 D01 Wireless Power Transfer v04

This device described above has been tested by Shenzhen HongBiao Certification& Testing Co., Ltd and the test results show that the equipment under test (EUT) is in compliance with the EMC requirements. And it is applicable only to the tested sample identified in the report.

Date of Test.....:

Date (s) of performance of tests: Jan. 25, 2024~ Jan. 31, 2024

Test Result.....: **Pass**

Testing Engineer :

Zoe Su

(Z o e S u)

Technical Manager :

Ming Liu

(Ming Liu)

Authorized Signatory :

Leo Su

(L e o S u)

[illegible]

1 General Description

1.1 Description of EUT

Product name:	MagSafe Power Bank with Built-in Cable
Model name:	C1020W
Series Model:	C1020
Different of series model:	There is no difference except the name of the model. All tests are made with the C1020W model.
Operation frequency:	115kHz~205kHz
Operational mode:	Wireless charging
Modulation type:	ASK
Antenna type:	Coil Antenna
Hardware version:	V1.1
Software version:	V1.0
Battery:	DC 3.85V, 10000mAh, 38.5Wh
Power supply:	Type-C Input: DC 5V/3A, 9V/2A Type-C Output: DC 5V/3A, 9V/2.22A, 12V/1.67A Lightning Cable Output: 5V/2A Type-C Output: DC 5V/3A, 9V/2A, 12V/1.5A Simultaneous Output: DC 5V/3A Wireless Charging Output: 5W, 7.5W, 10W, 15W
Adapter information:	N/A

1.2 Test Mode

Pretest Test Mode	Description of Mode
1	Wireless Output: 5W
2	Wireless Output: 7.5W
3	Wireless Output: 10W
4	Wireless Output: 15W

1.3 Test Setup

See photographs of the test setup in the report for the actual setup and connections between EUT and support equipment.

1.4 Ancillary Equipment

Equipment	Model	S/N	Manufacturer
Phone	iPhone 15 Pro Max	VJ9HQY39QJ	Apple Inc.

2 Test Facilities and Accreditations

2.1 Test Laboratory

Test Site	Shenzhen HongBiao Certification& Testing Co., Ltd
Test Site Location	Room 102, 201, Building 2, Yuanwanggu RFID Industrial Park, Tongguan Road, Tianliao Community, Yutang Street, Guangming District, Shenzhen, China
Telephone:	(86-755) 2998 9321
Fax:	(86-755) 2998 5110
FCC Registration No.:	CN1341
A2LA Certificate No.:	6765.01

2.2 Environmental Conditions

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

Temperature:	15°C~35°C
Relative Humidity:	20%~75%
Air Pressure:	98kPa~101kPa

2.3 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 %.

Measurement Frequency Range	U , (dB)	Note
RF frequency	2×10^{-5}	
E-field	± 2.5 dB	
H-field	± 4.2 dB	
Temperature	± 1 degree	
Humidity	± 5 %	

2.4 Test Software

Software name	Manufacturer	Model	Version
MAGPy V2.0	Schmid & Partner Engineering AG	MAGPy V2.0	V2.0

3 List of Test Equipment

Item	Equipment No.	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	/	Magnetic Amplitude and Gradient Probe System	Schmid & Partner Engineering AG	MAGPy V2.0	3061	2023-04-13	2024-04-12

MAGPy probe information:

Magnetic Amplitude and Gradient Probe System of probe MAGPy-8H3D+E3D consists of eight isotropic H-field subprobes and one isotropic E-field subprobe that are all integrated inside the probe head with a flat tip. Each isotropic H-field subprobe comprises three concentric orthogonal loop coil sensors. The isotropic E-field subprobe is composed of three orthogonal sensors (x and y sensors are dipoles and the sensor measuring the z component is a monopole). In total, the MAGPy-8H3D+E3D V2 probe is thus composed of nine subprobes and 27 single sensors that measure in the time-domain. The flat-tip probe design brings the sensors closer to the tip (e.g., the closest H-field sensors are now 7.5mm from the tip).

The probe specifications are provided in Table 2.1.

Parameter	Specs
PROBE DESIGN	
Diameter	60 mm
8 isotropic <i>H</i> -field sensors	concentric loops of 1 cm ² arranged at the corner of a cube of 22 mm side length
1 isotropic <i>E</i> -field sensor	orthogonal dipole/monopole (arm length: 50 mm)
Measurement center	18.5 mm from the probe tip
Temperature range	0–40 °C
Dimensions	110 × 635 × 35 mm (MAGPy-8H3D+E3D V2 & MAGPy-DAS V2)
<i>H</i> -FIELD SPECIFICATION	
Frequency range	3 kHz–10 MHz
Measurement range	0.1–3200 A/m, 0.12 μT–4 mT
Gradient range	0–80 T/m/T
<i>E</i> -FIELD SPECIFICATION	
Frequency range	3 kHz–10 MHz
Measurement range	0.08–2000 V/m

Table 2.1: MAGPy-8H3D+E3D V2 probe specifications

Note: the calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

4 RF Exposure

4.1 Maximum Permissible Exposure

4.1.1. Limit

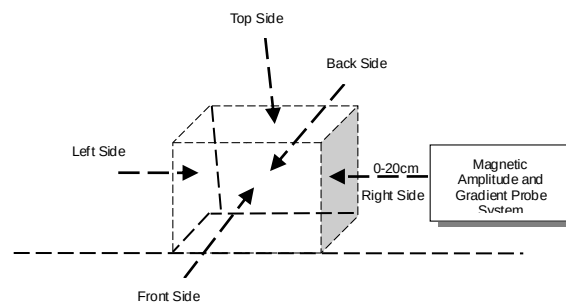
Frequency range(MHz)	Electric field strength(V/m)	Magnetic field strength(A/m)	Power density(mW/cm ²)	Averaging time(minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f ²	6
30-300	61.4	0.163	1.0 6	6
300-1500	/	/	f/300	6
1500-100000	/	/	5	6
(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
1500-100000	/	/	1	30

f = frequency in MHz * = Plane-wave equivalent power density

4.1.2. Test Procedures

- The RF exposure test was performed in anechoic chamber.
- Perform H-field measurements for each edge/top surface of the host/client pair at every 2 cm, starting from as close as possible out to 20 cm.
- The highest emission level was recorded and compared with limit.
- The EUT was measured according to the dictates of TCB Workshop "41-Part-18-&-Wireless-Power-Transfer - April 27, 2022"

4.1.3. Test Setup



4.1.4. Equipment Approval Considerations item 5 b) of KDB 680106 D01 Wireless Power Transfer v04

Requirement	Device
1. Power transfer frequency is less than 4 MHz.	Yes. The operating frequencies are: Operating Frequency: 115 kHz–205 kHz
2. Output power from each primary coil is less than or equal to 15 watts	Yes. The maximum output power is: Wireless Output: 5W/7.5W/10W/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. EUT has a source primary coil.
4. Client device is placed directly in contact with the transmitter.	Yes. The 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, EUT includes portable conditions.
6. The aggregate H-field strengths anywhere at or beyond 20 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. See the test result in item 4.1.5

4.1.5. Test Result

Portable exposure conditions:

Note: The client running mode (client battery status 1%, 50%, 99%) has been tested, and only the data of the client battery status 1% worst case is displayed.

H-field measurements are carried out every 2 cm (as close as possible to 20 cm) on each edge/top surface of the host/client pair and the conditions of portable use are evaluated. The report only reflects all the test distance model data.

Test condition 1: Client device mode 4 Working mode (Client device battery power 1%)

Test distance: 0cm

When using the testing instrument MAGPy for testing, when selecting compliance location as probe tip in the settings, the measured value is extrapolated to 0mm

Measurement results directly tested using MAGPy.

Maximum permissible Exposure				
Battery levels	Test sides	Test distance(cm)	E -field(V/m)	H-field(A/m)
<1%	Top	0	42.92	0.48
<1%	Left	0	19.61	0.36
<1%	Right	0	23.27	0.53
<1%	Front	0	32.19	0.38
<1%	Back	0	32.84	0.41
<1%	Bottom	0	40.52	0.55
Limit			614	1.63
Margin Limit (%)			6.99%	33.74%

When setting MAGPy to select compliance location as probe tip, the measured value is extrapolated to 0mm as the result.

Maximum permissible Exposure				
Battery levels	Test sides	Test distance(cm)	E -field(V/m)	H-field(A/m)
<1%	Top	0	43.56	0.56
<1%	Left	0	19.86	0.37
<1%	Right	0	24.53	0.57
<1%	Front	0	34.53	0.45
<1%	Back	0	33.69	0.46
<1%	Bottom	0	42.15	0.60
Limit			614	1.63
Margin Limit (%)			7.09%	36.42%

Measurement results directly tested using MAGPy.

Maximum permissible Exposure				
Battery levels	Test sides	Test distance(cm)	E -field(V/m)	H-field(A/m)
<1%	Top	2	41.53	0.46
<1%	Left	2	18.75	0.34
<1%	Right	2	22.96	0.51
<1%	Front	2	31.85	0.36
<1%	Back	2	31.54	0.40
<1%	Bottom	2	40.12	0.51
Limit			614	1.63
Margin Limit (%)			6.76%	31.29%

When setting MAGPy to select compliance location as probe tip, the measured value is extrapolated to 0mm as the result.

Maximum permissible Exposure				
Battery levels	Test sides	Test distance(cm)	E -field(V/m)	H-field(A/m)
<1%	Top	2	42.31	0.52
<1%	Left	2	19.23	0.36
<1%	Right	2	23.25	0.55
<1%	Front	2	33.53	0.44
<1%	Back	2	33.04	0.43
<1%	Bottom	2	41.42	0.58
Limit			614	1.63
Margin Limit (%)			6.89%	35.58%

Measurement results directly tested using MAGPy.

Maximum permissible Exposure				
Battery levels	Test sides	Test distance(cm)	E -field(V/m)	H-field(A/m)
<1%	Top	4	40.21	0.43
<1%	Left	4	18.23	0.31
<1%	Right	4	22.45	0.50
<1%	Front	4	30.21	0.34
<1%	Back	4	31.36	0.36
<1%	Bottom	4	39.86	0.48
Limit			614	1.63
Margin Limit (%)			6.55%	30.67%

When setting MAGPy to select compliance location as probe tip, the measured value is extrapolated to 0mm as the result.

Maximum permissible Exposure				
Battery levels	Test sides	Test distance(cm)	E -field(V/m)	H-field(A/m)
<1%	Top	4	41.02	0.46
<1%	Left	4	19.54	0.32
<1%	Right	4	23.25	0.53
<1%	Front	4	31.12	0.39
<1%	Back	4	32.25	0.40
<1%	Bottom	4	40.22	0.52
Limit			614	1.63
Margin Limit (%)			6.68%	32.52%

Measurement results directly tested using MAGPy.

Maximum permissible Exposure				
Battery levels	Test sides	Test distance(cm)	E -field(V/m)	H-field(A/m)
<1%	Top	6	40.23	0.45
<1%	Left	6	19.52	0.33
<1%	Right	6	23.14	0.52
<1%	Front	6	31.52	0.38
<1%	Back	6	30.28	0.39
<1%	Bottom	6	39.85	0.51
Limit			614	1.63
Margin Limit (%)			6.55%	31.90%

When setting MAGPy to select compliance location as probe tip, the measured value is extrapolated to 0mm as the result.

Maximum permissible Exposure				
Battery levels	Test sides	Test distance(cm)	E -field(V/m)	H-field(A/m)
<1%	Top	6	40.18	0.42
<1%	Left	6	19.44	0.31
<1%	Right	6	23.13	0.51
<1%	Front	6	31.51	0.36
<1%	Back	6	30.26	0.37
<1%	Bottom	6	39.75	0.42
Limit			614	1.63
Margin Limit (%)			6.54%	31.29%

Measurement results directly tested using MAGPy.

Maximum permissible Exposure				
Battery levels	Test sides	Test distance(cm)	E -field(V/m)	H-field(A/m)
<1%	Top	8	39.85	0.43
<1%	Left	8	18.24	0.31
<1%	Right	8	22.96	0.51
<1%	Front	8	31.32	0.36
<1%	Back	8	30.12	0.35
<1%	Bottom	8	39.62	0.50
Limit			614	1.63
Margin Limit (%)			6.49%	31.29%

When setting MAGPy to select compliance location as probe tip, the measured value is extrapolated to 0mm as the result.

Maximum permissible Exposure				
Battery levels	Test sides	Test distance(cm)	E -field(V/m)	H-field(A/m)
<1%	Top	8	39.45	0.41
<1%	Left	8	18.23	0.30
<1%	Right	8	22.41	0.49
<1%	Front	8	31.31	0.35
<1%	Back	8	30.08	0.32
<1%	Bottom	8	39.42	0.49
Limit			614	1.63
Margin Limit (%)			6.43%	30.06%

Measurement results directly tested using MAGPy.

Maximum permissible Exposure				
Battery levels	Test sides	Test distance(cm)	E -field(V/m)	H-field(A/m)
<1%	Top	10	39.69	0.41
<1%	Left	10	18.12	0.30
<1%	Right	10	22.92	0.48
<1%	Front	10	31.31	0.35
<1%	Back	10	30.02	0.32
<1%	Bottom	10	39.48	0.48
Limit			614	1.63
Margin Limit (%)			6.46%	29.45%

When setting MAGPy to select compliance location as probe tip, the measured value is extrapolated to 0mm as the result.

Maximum permissible Exposure				
Battery levels	Test sides	Test distance(cm)	E -field(V/m)	H-field(A/m)
<1%	Top	10	39.54	0.38
<1%	Left	10	18.11	0.29
<1%	Right	10	22.91	0.46
<1%	Front	10	31.28	0.32
<1%	Back	10	30.01	0.31
<1%	Bottom	10	39.39	0.46
Limit			614	1.63
Margin Limit (%)			6.44%	28.22%

Measurement results directly tested using MAGPy.

Maximum permissible Exposure				
Battery levels	Test sides	Test distance(cm)	E -field(V/m)	H-field(A/m)
<1%	Top	12	39.54	0.39
<1%	Left	12	18.11	0.29
<1%	Right	12	22.85	0.46
<1%	Front	12	31.26	0.31
<1%	Back	12	29.74	0.27
<1%	Bottom	12	39.32	0.44
Limit			614	1.63
Margin Limit (%)			6.44%	28.22%

When setting MAGPy to select compliance location as probe tip, the measured value is extrapolated to 0mm as the result.

Maximum permissible Exposure				
Battery levels	Test sides	Test distance(cm)	E -field(V/m)	H-field(A/m)
<1%	Top	12	39.47	0.36
<1%	Left	12	18.06	0.28
<1%	Right	12	22.81	0.44
<1%	Front	12	31.19	0.28
<1%	Back	12	29.68	0.23
<1%	Bottom	12	39.22	0.41
Limit			614	1.63
Margin Limit (%)			6.43%	26.99%

Measurement results directly tested using MAGPy.

Maximum permissible Exposure				
Battery levels	Test sides	Test distance(cm)	E -field(V/m)	H-field(A/m)
<1%	Top	13	39.49	0.37
<1%	Left	13	18.07	0.25
<1%	Right	13	22.69	0.42
<1%	Front	13	31.24	0.28
<1%	Back	13	29.68	0.25
<1%	Bottom	13	39.31	0.41
Limit			614	1.63
Margin Limit (%)			6.43%	25.77%

When setting MAGPy to select compliance location as probe tip, the measured value is extrapolated to 0mm as the result.

Maximum permissible Exposure				
Battery levels	Test sides	Test distance(cm)	E -field(V/m)	H-field(A/m)
<1%	Top	13	39.42	0.36
<1%	Left	13	18.05	0.24
<1%	Right	13	22.58	0.41
<1%	Front	13	31.21	0.27
<1%	Back	13	29.57	0.23
<1%	Bottom	13	39.28	0.40
Limit			614	1.63
Margin Limit (%)			6.42%	25.15%

Measurement results directly tested using MAGPy.

Maximum permissible Exposure				
Battery levels	Test sides	Test distance(cm)	E -field(V/m)	H-field(A/m)
<1%	Top	14	39.42	0.35
<1%	Left	14	18.06	0.24
<1%	Right	14	22.62	0.41
<1%	Front	14	31.21	0.27
<1%	Back	14	29.65	0.24
<1%	Bottom	14	39.28	0.39
Limit			614	1.63
Margin Limit (%)			6.42%	25.15%

When setting MAGPy to select compliance location as probe tip, the measured value is extrapolated to 0mm as the result.

Maximum permissible Exposure				
Battery levels	Test sides	Test distance(cm)	E -field(V/m)	H-field(A/m)
<1%	Top	14	39.36	0.34
<1%	Left	14	18.05	0.23
<1%	Right	14	22.61	0.39
<1%	Front	14	31.18	0.25
<1%	Back	14	29.58	0.22
<1%	Bottom	14	39.21	0.36
Limit			614	1.63
Margin Limit (%)			6.41%	23.93%

Measurement results directly tested using MAGPy.

Maximum permissible Exposure				
Battery levels	Test sides	Test distance(cm)	E -field(V/m)	H-field(A/m)
<1%	Top	16	39.35	0.34
<1%	Left	16	18.02	0.23
<1%	Right	16	22.54	0.39
<1%	Front	16	31.18	0.26
<1%	Back	16	29.64	0.22
<1%	Bottom	16	39.26	0.38
Limit			614	1.63
Margin Limit (%)			6.41%	23.93%

When setting MAGPy to select compliance location as probe tip, the measured value is extrapolated to 0mm as the result.

Maximum permissible Exposure				
Battery levels	Test sides	Test distance(cm)	E -field(V/m)	H-field(A/m)
<1%	Top	16	39.33	0.32
<1%	Left	16	18.01	0.21
<1%	Right	16	22.52	0.36
<1%	Front	16	31.16	0.25
<1%	Back	16	29.62	0.21
<1%	Bottom	16	39.24	0.36
Limit			614	1.63
Margin Limit (%)			6.41%	22.09%

Measurement results directly tested using MAGPy.

Maximum permissible Exposure				
Battery levels	Test sides	Test distance(cm)	E -field(V/m)	H-field(A/m)
<1%	Top	18	39.28	0.31
<1%	Left	18	18.01	0.22
<1%	Right	18	22.52	0.34
<1%	Front	18	31.16	0.23
<1%	Back	18	29.62	0.21
<1%	Bottom	18	39.23	0.33
Limit			614	1.63
Margin Limit (%)			6.40%	20.86%

When setting MAGPy to select compliance location as probe tip, the measured value is extrapolated to 0mm as the result.

Maximum permissible Exposure				
Battery levels	Test sides	Test distance(cm)	E -field(V/m)	H-field(A/m)
<1%	Top	18	39.24	0.29
<1%	Left	18	17.96	0.21
<1%	Right	18	22.45	0.32
<1%	Front	18	31.12	0.21
<1%	Back	18	29.61	0.19
<1%	Bottom	18	39.12	0.31
Limit			614	1.63
Margin Limit (%)			6.39%	19.63%

Measurement results directly tested using MAGPy.

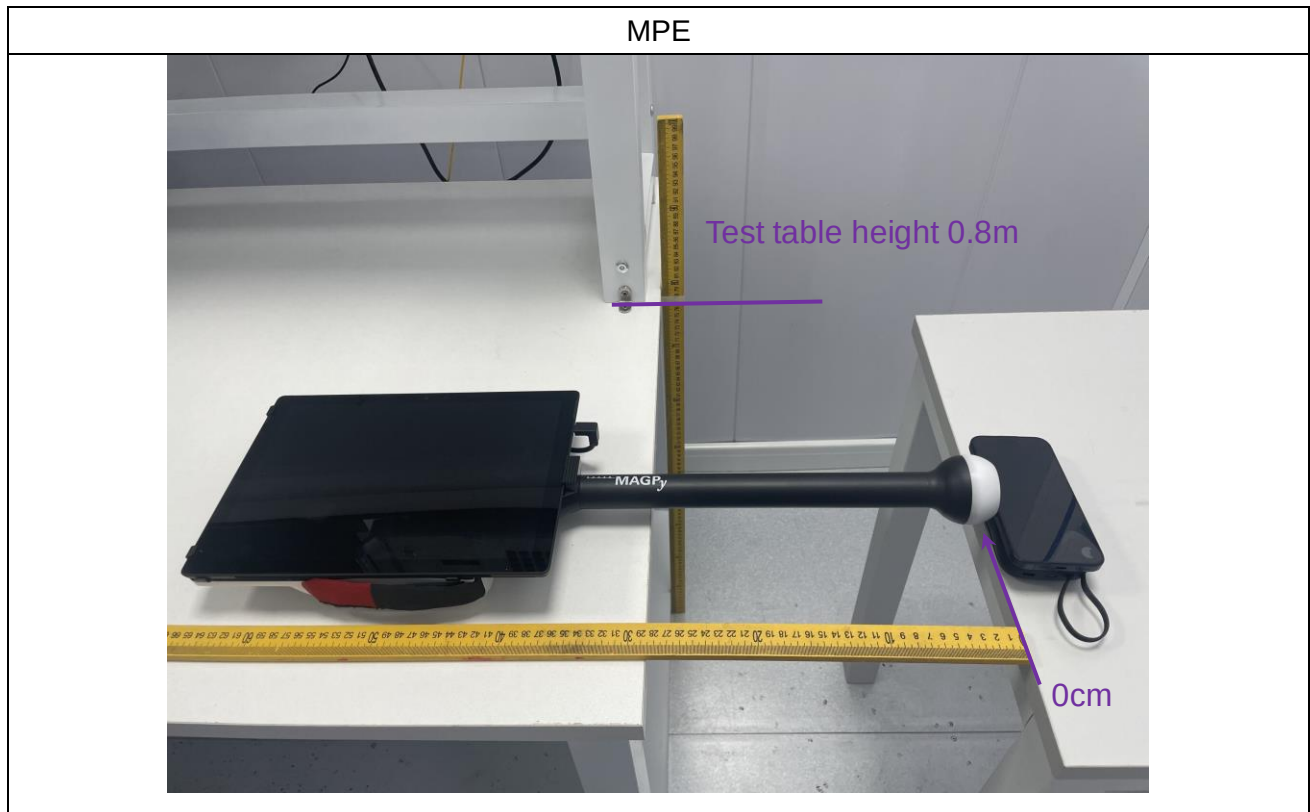
Maximum permissible Exposure				
Battery levels	Test sides	Test distance(cm)	E -field(V/m)	H-field(A/m)
<1%	Top	20	39.14	0.28
<1%	Left	20	17.95	0.21
<1%	Right	20	22.41	0.31
<1%	Front	20	31.12	0.21
<1%	Back	20	29.56	0.20
<1%	Bottom	20	39.21	0.30
Limit			614	1.63
Margin Limit (%)			6.39%	19.02%

When setting MAGPy to select compliance location as probe tip, the measured value is extrapolated to 0mm as the result.

Maximum permissible Exposure				
Battery levels	Test sides	Test distance(cm)	E -field(V/m)	H-field(A/m)
<1%	Top	20	39.12	0.26
<1%	Left	20	17.85	0.19
<1%	Right	20	22.36	0.29
<1%	Front	20	31.05	0.17
<1%	Back	20	29.52	0.19
<1%	Bottom	20	39.18	0.25
Limit			614	1.63
Margin Limit (%)			6.38%	17.79%

The consistency between the model and the (E field and/or H field) probe measurements is within 30%, which is sufficient for verification

5 Photographs of the Test Setup



***** END OF REPORT *****