

RF EXPOSURE Test Report

Product: mophie snap+powerstation mini with stand
Trade Mark: mophie
Model Number: SNP-PS-MINI-STND-5K
FCC ID: 2ACWB-5KSTDQ2

Prepared for

mophie LLC

6244 Technology Ave. Kalamazoo, MI 49009, United States of America.

Prepared by

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TEST RESULT CERTIFICATION

Applicant's Name : mophie LLC
Address : 6244 Technology Ave. Kalamazoo, MI 49009,United States of America.

Manufacturer's Name : mophie LLC
Address : 6244 Technology Ave. Kalamazoo, MI 49009,United States of America.

Product description

Product name : mophie snap+powerstation mini with stand
Model Number : SNP-PS-MINI-STND-5K

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.

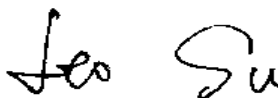
Date of Test

Date (s) of performance of tests : Jan. 29, 2024~Jan. 31, 2024

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

Testing Engineer : 
(Z o e S u)

Technical Manager : 
(G a r y L u)

Authorized Signatory : 
(L e o S u)

1 General Description

1.1 Description of EUT

| | |
|----------------------------|---|
| Product name: | mophie snap+powerstation mini with stand |
| Model name: | SNP-PS-MINI-STND-5K |
| Series Model: | N/A |
| Different of series model: | N/A |
| Operation frequency: | 110.5kHz-205kHz, 360kHz |
| Operational mode: | Wireless charging |
| Modulation type: | FSK |
| Antenna type: | Coil Antenna |
| Hardware version: | V0.3 |
| Software version: | V0.2 |
| Battery: | DC 3.85V, 5000mAh, 19.25Wh |
| Power supply: | Input: DC 5V/3A, 9V/2.22A Output (USB-C): DC 5V/3A, 9V/2.22A Output (Wireless): 5W, 7.5W, 15W Output (Multi-output): USB-C 5V/1A Max Wireless 7.5W |
| 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: 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 12 Pro | DNPF9UL20D9L | 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 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 %.

| 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

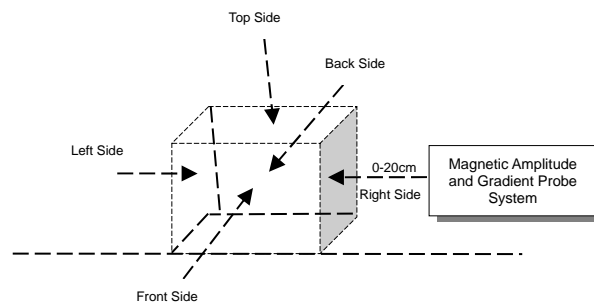
- a. The RF exposure test was performed in anechoic chamber.
- b. Perform H-field measurements for each edge/top surface of the host/client pair at every 2 cm, starting from as close as possible out to 20 cm.
- c. The highest emission level was recorded and compared with limit.
- d. The EUT was measured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

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

| Requirement | Device |
|---|--|
| 1. Power transfer frequency is less than 1 MHz. | Yes. The operating frequencies are: 110.5kHz~205kHz, 360kHz |
| 2. Output power from each primary coil is less than or equal to 15 watts | Yes. The maximum output power is: Wireless Output: 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 |

4.1.4. Test Setup



4.1.5. Test Result

For portable exposure condition:

Note: operating modes with client device (1 %, 50%, 99% battery status of client device) have been test, only show the data of worst case of 1% battery status of client device.

H-field measurements taken every 2 cm (starting as close to 20 cm as possible) on each edge/top surface of the host/client pair were also evaluated for portable use conditions. The report reflects data for the worst 0-4cm test distance mode only.

Test condition 1: Mode 3 operating mode with client device (1 % battery status of client device)
-test distance: 0cm

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 | 28.6 | 0.62 |
| <1% | Left | 0 | 16.5 | 0.02 |
| <1% | Right | 0 | 15.8 | 0.08 |
| <1% | Front | 0 | 68.5 | 0.36 |
| <1% | Back | 0 | 46.8 | 0.19 |
| <1% | Bottom | 0 | 24.6 | 0.11 |
| Limit | | | 614 | 1.63 |
| Margin Limit (%) | | | 11.16% | 38.04% |

Test condition 1: Mode 3 operating mode with client device (1 % battery status of client device)
-test distance: 2cm

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 | 25.4 | 0.54 |
| <1% | Left | 0 | 14.5 | 0.04 |
| <1% | Right | 0 | 11.2 | 0.04 |
| <1% | Front | 0 | 64.5 | 0.32 |
| <1% | Back | 0 | 42.2 | 0.17 |
| <1% | Bottom | 0 | 23.1 | 0.16 |
| Limit | | | 614 | 1.63 |
| Margin Limit (%) | | | 10.50% | 33.13% |

Test condition 1: Mode 3 operating mode with client device (1 % battery status of client device)
-test distance: 4cm

Measurement results directly tested using MAGPy.

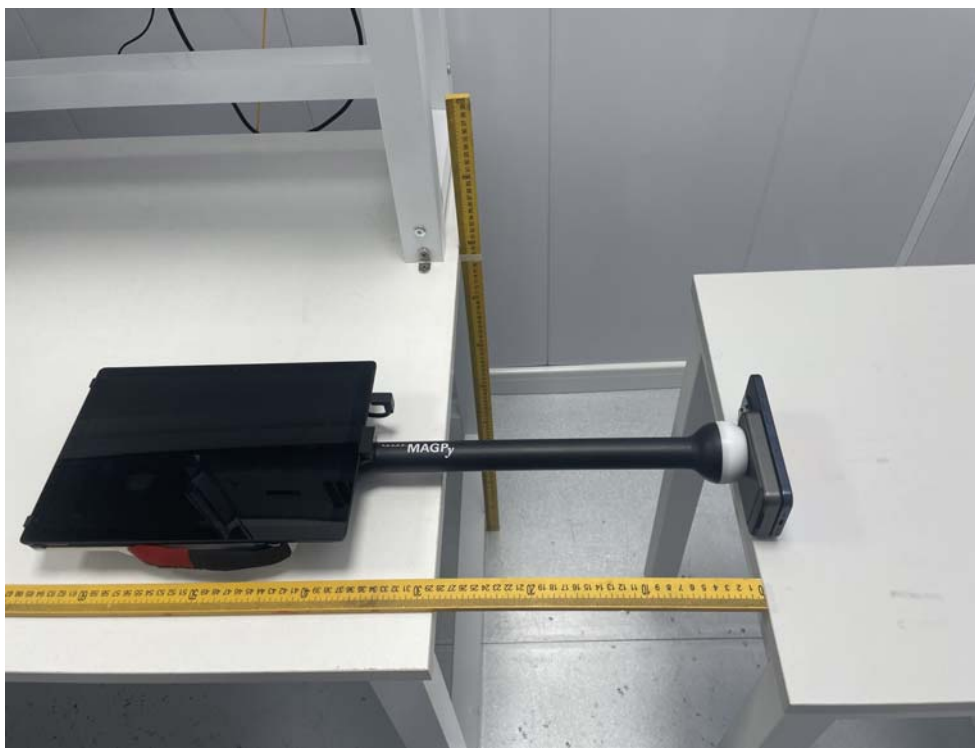
| Maximum permissible Exposure | | | | |
|------------------------------|------------|-------------------|---------------|--------------|
| Battery levels | Test sides | Test distance(cm) | E -field(V/m) | H-field(A/m) |
| <1% | Top | 0 | 20.6 | 0.44 |
| <1% | Left | 0 | 11.4 | 0.03 |
| <1% | Right | 0 | 9.4 | 0.02 |
| <1% | Front | 0 | 59.4 | 0.27 |
| <1% | Back | 0 | 39.6 | 0.13 |
| <1% | Bottom | 0 | 21.2 | 0.12 |
| Limit | | | 614 | 1.63 |
| Margin Limit (%) | | | 9.67% | 26.99% |

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 | 30.2 | 0.67 |
| <1% | Left | 0 | 17.3 | 0.05 |
| <1% | Right | 0 | 16.9 | 0.10 |
| <1% | Front | 0 | 72.1 | 0.42 |
| <1% | Back | 0 | 51.6 | 0.12 |
| <1% | Bottom | 0 | 28.4 | 0.18 |
| Limit | | | 614 | 1.63 |
| Margin Limit (%) | | | 11.74% | 41.10% |

5 Photographs of the Test Setup

MPE



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