
RF Exposure Report

Report No.: AGC01741240602FH01

FCC ID : 2AYT3-AC50P

APPLICATION PURPOSE : Original Equipment

PRODUCT DESIGNATION : Portable Power Station

BRAND NAME : BLUETTI

MODEL NAME : AC50P

APPLICANT : SHENZHEN POWEROAK NEWENER CO., LTD

DATE OF ISSUE : Oct. 23, 2024

STANDARD(S) : KDB 680106 D01 Wireless Power Transfer v04

REPORT VERSION : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd



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Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Oct. 23, 2024	Valid	Initial Release

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1. General Information

Applicant	SHENZHEN POWEROAK NEWENER CO., LTD
Address	F19, BLD No.1, Kaidaer Tongsha Rd No.168, Xili Street, Nanshan, Shenzhen, China
Manufacturer	SHENZHEN POWEROAK NEWENER CO., LTD
Address	F19, BLD No.1, Kaidaer Tongsha Rd No.168, Xili Street, Nanshan, Shenzhen, China
Factory	Huizhou PowerOak Innovation Co., Ltd
Address	(No.1 Workshop) Longsheng 5th Road, Laoshe Village, Dayawan West Zone, Huizhou, Guangdong, China
Product Designation	Portable Power Station
Brand Name	BLUETTI
Test Model	AC50P
Series Model(s)	N/A
Difference Description	N/A
Date of receipt of test item	Sep. 06, 2024
Date of Test	Sep. 06, 2024 to Oct. 23, 2024
Deviation from Standard	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Test Report Form No	AGCER-FCC-RF Exposure (WPT)-V1

The test results of this report relate only to the tested sample identified in this report.

Prepared By		
	Jack Gui (Project Engineer)	Oct. 23, 2024
Reviewed By		
	Calvin Liu (Reviewer)	Oct. 23, 2024
Approved By		
	Max Zhang (Authorized Officer)	Oct. 23, 2024

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2. Product Information

2.1 Product Technical Description

Equipment Specification	WPT
Operation Frequency Range	110.5kHz-148kHz
Hardware Version	19.0601.1142-01
Software Version	2171-01
Modulation Type	FSK
Field Strength of Fundamental	72.69dBuV/m@3m (Max)
Antenna Designation	Coil Antenna
Antenna Gain	0dBi
Input Rating	AC: 120V~50/60Hz, 9A DC/PV: 12V-28V=8.5A, 200W Max.
Output Rating	AC: 120V~50/60Hz, 700W Total USB-A: 5V=3A USB-C: 5/9/12/15/20V=3A; 20V=3.25A each port (With E-Marker chip built in) Cigarette Lighter Port: 12V=10A Wireless Charging: 5/7.5/10/15W AC & DC Output: 700W Total

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3. Test Environment

3.1 Address of The Test Laboratory

Laboratory: Attestation of Global Compliance (Shenzhen) Co., Ltd.

Address: 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

3.2 Test Facility

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

CNAS-Lab Code: L5488

Attestation of Global Compliance (Shenzhen) Co., Ltd. has been assessed and proved to FOLLOW CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories.)

A2LA-Lab Cert. No.: 5054.02

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to follow 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.

FCC-Registration No.: 975832

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory 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 with Registration 975832.

IC-Registration No.: 24842 (CAB identifier: CN0063)

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Certification and Engineering Bureau of Industry Canada. The acceptance letter from the IC is maintained in our files with Registration 24842.

3.3 Environmental Conditions

	Normal Conditions
Temperature range (°C)	15 - 35
Relative humidity range	20% - 75%
Pressure range (kPa)	86 - 106
Power supply	--

3.4 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%.

Item	Measurement Uncertainty
E-Field Strength(0.003-0.4MHz)	$\pm 1.5\text{dB}$
E-Field Strength(0.4-10MHz)	$\pm 1.3\text{dB}$
B-Field (0.003-0.4MHz)	$\pm 1.3\text{dB}$
B-Field (0.4-10MHz)	$\pm 1.2\text{dB}$

3.5 List of Equipment Used

Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
<input checked="" type="checkbox"/>	AGC-RF-011	Broadband Field Meter	WAVECONTROL	SMP2	19SN1101	2023-02-24	2025-02-23
<input checked="" type="checkbox"/>	AGC-RF-012	Probe FHP	WAVECONTROL	WP400	19WP100558	2023-02-24	2025-02-23

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4. Equipment Used in Tested System

The following peripheral devices and interface cables were connected during the measurement:

☒ Test Accessories Come From The Laboratory

No.	Equipment	Model No.	Manufacturer	Specification Information	Cable
1	Wireless charging load	N/A	Y&Z	Support 5W,7.5W,10W,15W	--
2	AC POWER LINE	--	--	--	1.2m,unshielded

☐ Test Accessories Come From The Manufacturer

No.	Equipment	Manufacturer	Model No.	Specification Information	Cable
1	--	--	--	--	--

5. Description of Test Modes

NO.	Test Mode Description	Exposure Conditions
1	AC input + EUT + Wireless load (15W)	Mobile
2	AC input + EUT + Wireless load (10W)	Mobile
3	AC input + EUT + Wireless load (7.5W)	Mobile
4	AC input + EUT + Wireless load (5W)	Mobile
5	AC input + EUT + Wireless load (Null load)	Mobile
6	EUT + Wireless load (15W)	Mobile
7	EUT + Wireless load (10W)	Mobile
8	EUT + Wireless load (7.5W)	Mobile
9	EUT + Wireless load (5W)	Mobile
10	EUT + Wireless load (Null load)	Mobile

Note:

- Only the result of the worst case (mode 1- full load) was recorded in the report, if no other cases
- The EUT supports 15W, 10W, 7.5W, 5W "wireless output, and all modes have been tested at full load, half load and null load, only the worst mode is reflected in the report.

6. RF Exposure Measurement

6.1 Refer Evaluation Method

ANSI C95.1–1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

FCC KDB publication KDB680106 D01 RF Exposure Wireless Charging Apps v04: RF Exposure Considerations for Low Power Consumer Wireless Power Transfer Applications

FCC CFR 47 part1 1.1310: Radiofrequency radiation exposure limits.

FCC CFR 47 part2 2.1091: Radiofrequency radiation exposure evaluation: mobile devices.

FCC CFR 47 part 18.107: Industrial, Scientific, and Medical Equipment.

6.2 Measurement 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 KDB 680106 D01v04 Section 3. RF Exposure Requirements clause 3.2 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 1.1310 as following:

	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 _{30MHz})	2.19/f (=0.073 _{30MHz})	--

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

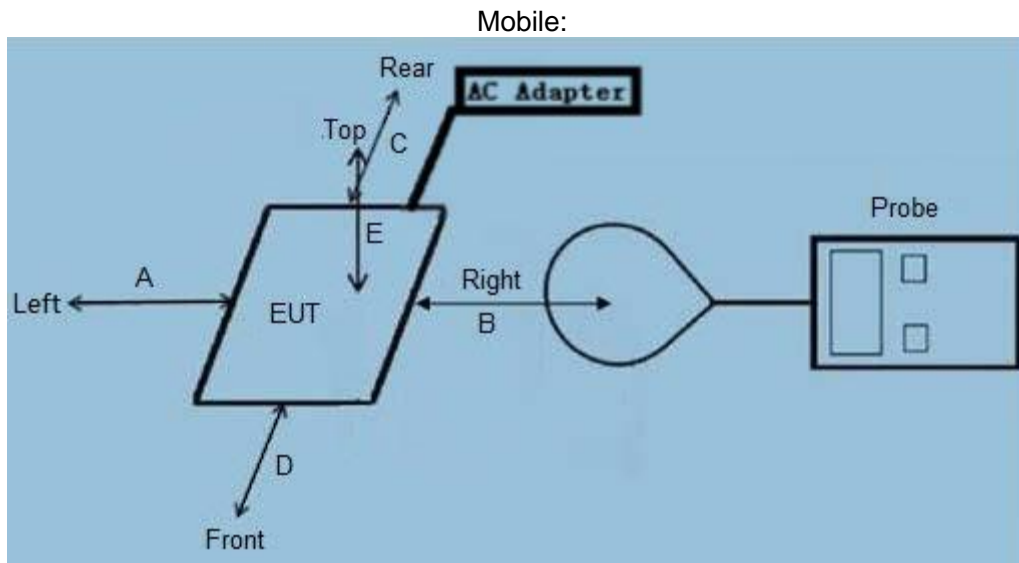
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6.3 Measurement Setup



Note:

- RF exposure assessment tests are conducted in a shielded room.
- Refer to the following test method description for the test distance between the edge of the charger and the measuring probe.
- As shown in the above picture, the test layout is not for the real object, only the requirements of the test layout listed in the standard requirements are presented, for reference only.
- The actual test EUT distinguishes the test type according to the requirements as shown in the figure above.

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6.4 Measurement Procedure

6.4.1 For mobile RF exposure:

- The RF exposure test was performed on 360 degree turn table in anechoic chamber.
- E-field and H-field measurements should be taken with the probe geometric center located 20cm around the EUT and 20cm above the top surface of the master/client pair.
- The highest emission level was recorded and compared with limit as soon as measurement of each point (A, B, C, D, E) were completed.
- The EUT were measured according to the dictates of KDB 680106 D01v04

Equipment Approval Considerations of KDB 680106 D01v04

Requirements of KDB 680106	Description
(1) The power transfer frequency is below 1MHz.	The device operates in the frequency range 110.5kHz-148kHz.
(2) The output power from each transmitting element (e.g., coil) is less than or equal to 15 watts.	The maximum output power of the primary coil is 15W.
(3) 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)	Client device is placed directly in contact with the transmitter.
(4) Only \$2.1091-Mobile exposure conditions apply (i.e., this provision does not cover \$ 2.1093-Portable exposure conditions).	Device can be used in Mobile conditions.
(5) 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, per KDB 447498, Table 1. These measurements shall be taken along the principal axes of the device, with one axis oriented along the direction of the estimated maximum field strength, and for three points per axis or until a 1/d (inverse distance from the emitter structure) field strength decay is observed. Symmetry considerations may be used for test reduction purposes. The device shall be operated in documented worst-case compliance scenarios (i.e., the ones that lead to the maximum field components), and while all the radiating structures (e.g., coils or antennas) that by design can simultaneously transmit are energized at their nominal maximum power.	The EUT H-field strengths at 20cm 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.
(6) For systems with more than one radiating structure, the conditions specified in (5) must be met when the system is fully loaded (i.e., clients absorbing maximum power available), and with all the radiating structures operating at maximum power at the same time, as per design conditions. If the design allows one or more radiating structures to be powered at a higher level while other radiating structures are not powered, then those cases must be tested as well. For instance, a device may use three RF coils powered at 5 W, or one coil powered at 15 W: in this case, both scenarios shall be tested.	The transfer system includes single coil that is able to detect receiver device.

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6.5 Measurement Results

Mobile devices are evaluated as follows:

Operate Mode	Field Strength	Measured H-Field Strength Values (A/m) Measured E-Field Strength Values (V/m)					FCC Limit	50%_FCC limit
		Position A	Position B	Position C	Position D	Position E		
Mode 1	nT	226.13	288.94	314.07	276.38	238.69	--	--
Mode 1	A/m	0.18	0.23	0.25	0.22	0.19	1.63	0.815
Mode 1	V/m	0.724	0.734	0.726	0.745	0.718	614	307

Note: Unit conversion formula: $1\text{ut}=1.25\text{A/m}$

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Appendix I: Photographs of Test Setup

Refer to the Report No.: AGC01741240602AP02

-----End of Report-----

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1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd (the “Company”) solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the “Clients”).
2. Any report issued by Company as a result of this application for testing services (the “Report”) shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.
3. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.
4. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.
5. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.
6. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.
7. Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.
8. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.
9. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.

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