



Microtest
微 测 检 测

RF EXPOSURE Test Report

Report No.: MTi240424012-27E2

Date of issue: 2024-09-10

Applicant: SHENZHEN POWEROAK NEWENER CO., LTD

Product: Portable Power Station

Model(s): Handsfree 2

FCC ID: 2AYT3-HANDSFREE2

Shenzhen Microtest Co., Ltd.

<http://www.mtitest.cn>



Instructions

1. The report shall not be partially reproduced without the written consent of the laboratory;
2. The test results of this report are only responsible for the samples submitted;
3. This report is invalid without the seal and signature of the laboratory;
4. This report is invalid if transferred, altered or tampered with in any form without authorization;
5. Any objection to this report shall be submitted to the laboratory within 15 days from the date of receipt of the report.



Test Result Certification	
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
Product description	
Product name:	Portable Power Station
Trademark:	BLUETTI
Model name:	Handsfree 2
Series Model:	N/A
Standards:	N/A
Test procedure:	KDB 447498 D01 v06
Date of Test	
Date of test:	2024-06-01 to 2024-06-26
Test result:	Pass

Test Engineer	:	<i>James Qin</i>
		(James Qin)
Reviewed By	:	<i>David. Lee</i>
		(David Lee)
Approved By	:	<i>Leon Chen</i>
		(Leon Chen)



RF EXPOSURE EVALUATION

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) Radiation as specified in §1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

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
300-1,500			f/300	6
1,500-100,000			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
300-1,500			f/1500	30
1,500-100,000			1.0	30

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

MPE Calculation Method

Friis transmission formula: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

Where

P_d = Power density in mW/cm²

P_{out} = output power to antenna in mW

G = Numeric gain of the antenna relative to isotropic antenna

π = 3.1415926

R = distance between observation point and center of the radiator in cm(20cm)

P_d the limit of MPE, 1mW/cm². If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

Measurement Result

BLE:

Operation Frequency: 2402-2480MHz,

Power density limited: 1mW/ cm²

Antenna Type: PCB Antenna

Antenna gain: -2.31dBi

R=20cm

$mW=10^{(dBm/10)}$

antenna gain Numeric= $10^{(dBi/10)}=10^{(-2.31/10)}=0.59$

BLE:

Channel Freq. (MHz)	modulation	conducted power	Tune-up power (dBm)	Max		Antenna		Evaluation result	Power density Limits
		(dBm)		tune-up power		Gain		(mW/cm ²)	(mW/cm ²)
				(dBm)	(mW)	(dBi)	Numeric		
2402	BLE-1M	1.22	1±1	2	1.585	-2.31	0.59	0.0002	1
2440		1.23	1±1	2	1.585	-2.31	0.59	0.0002	1
2480		0.68	0±1	1	1.259	-2.31	0.59	0.0001	1
2402	BLE- 2M	1.23	1±1	2	1.585	-2.31	0.59	0.0002	1
2440		1.22	1±1	2	1.585	-2.31	0.59	0.0002	1
2480		0.71	0±1	1	1.259	-2.31	0.59	0.0001	1

Conclusion:

For the max result: $0.0002 \leq 1.0$, No SAR is required

----END OF REPORT----