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# 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;
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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 <sup>2</sup> ) | Averaging time (minutes) |
|----------------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| <b>(A) Limits for Occupational/Controlled Exposure</b>         |                               |                               |                                     |                          |
| 0.3-3.0                                                        | 614                           | 1.63                          | *100                                | 6                        |
| 3.0-30                                                         | 1842/f                        | 4.89/f                        | *900/f <sup>2</sup>                 | 6                        |
| 30-300                                                         | 61.4                          | 0.163                         | 1.0                                 | 6                        |
| 300-1,500                                                      |                               |                               | f/300                               | 6                        |
| 1,500-100,000                                                  |                               |                               | 5                                   | 6                        |
| <b>(B) Limits for General Population/Uncontrolled Exposure</b> |                               |                               |                                     |                          |
| 0.3-1.34                                                       | 614                           | 1.63                          | *100                                | 30                       |
| 1.34-30                                                        | 824/f                         | 2.19/f                        | *180/f <sup>2</sup>                 | 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/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

$G$  = Numeric gain of the antenna relative to isotropic antenna

$\pi$  = 3.1415926

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

$P_d$  the limit of MPE, 1mW/cm<sup>2</sup>. 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/ cm<sup>2</sup>

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.<br>(MHz) | modulation | conducted power | Tune-up power<br>(dBm) | Max           |       | Antenna |         | Evaluation result     | Power density Limits  |
|------------------------|------------|-----------------|------------------------|---------------|-------|---------|---------|-----------------------|-----------------------|
|                        |            | (dBm)           |                        | tune-up power |       | Gain    |         | (mW/cm <sup>2</sup> ) | (mW/cm <sup>2</sup> ) |
|                        |            |                 |                        | (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----