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RF Exposure Evaluation Report

Report No. : CQASZ20210400024EX-02

Applicant: SHENZHEN POWEROAK NEWENER CO.,LTD

Address of Applicant: Room 701-3, Building B, CADRE Building, Tongsha Road, Nanshan District, Shenzhen City, Guangdong Province, P.R.China

Manufacturer: SHENZHEN POWEROAK NEWENER CO.,LTD

Address of Manufacturer: Room 701-3, Building B, CADRE Building, Tongsha Road, Nanshan District, Shenzhen City, Guangdong Province, P.R.China

Equipment Under Test (EUT):

Product: ESS(Energy Storage System)

All Model No.: EB200, S2000

Test Model No.: EB200

Brand Name: /

FCC ID: 2AYT3-EB200

Standards: 47 CFR Part 1.1307
47 CFR Part 1.1310
KDB 680106 D01 RF Exposure wireless charging base App V03

Date of Test: Apr. 02, 2021 -- Apr. 22, 2021

Date of Issue: Apr. 22, 2021

Test Result : **PASS**

Tested By:

Jun Li

(Jun Li)

Reviewed By:

Ares Liu

(Ares Liu)

Approved By:

Sheek Luo

(Sheek luo)



1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20210400024EX-02	Rev.01	Initial report	Apr. 22, 2021

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3 General Information

3.1 Client Information

Applicant:	SHENZHEN POWEROAK NEWENER CO.,LTD
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3.2 General Description of EUT

Product Name:	ESS(Energy Storage System)
Test Model No.:	EB200
Trade Mark:	N/A
Hardware Version:	V2.0
Software Version:	V1.0
Operation Frequency:	125kHz -152kHz
Modulation Type:	MSK
Antenna Type:	Loop coil antenna
Antenna Gain:	0 dBi
Information:	Capacity:2000Wh 50VDC, 40Ah Input: DC 12-150VDC , 12A Input adapter: 58.8VDC, 8A Output: AC*6: 110-120VAC 50/60Hz, 2000W Total Aviation Sockets*1: 12VDC, 25A USB-A*2: 5-12VDC, 3A, 36W Total USB-A*2: 5VDC ,3A, 15W Total USB-C*1: 5-15VDC, 3A, 20VDC,5A Cigarette lighter*1: 12VDC, 10A DC 5521*2: 12VDC, 10A Wireless Charging*2: 5/7/7.5/10/15W

Note: For more details features description, please refer to the manufacture's specifications or the usermanual.

3.3 Test environment

Operating Environment:	
Temperature:	25.0 °C
Humidity:	53 % RH
Atmospheric Pressure:	1010mbar
Test Mode:	
Mode 1	Charging (DC port)
Mode 2	Charging (adapter)
Mode 3	AC*6(2000W max)
Mode 4	DC 12V *3
Mode 5	USB*5
Mode 6	Wireless charging*2(5W*2)
Mode 7	Wireless charging*2(7.5W*2)
Mode 8	Wireless charging*2(10W*2)
Mode 9	Wireless charging*2(15W*2)
Mode 10	Mode 3+ Mode 4+ Mode 5+ Mode 9
Note: The mode 10 was the worst case and only the data of the worst case record in this report	

3.4 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	emark	FCC certification
Adapter	/	/	Provide by applicant	sdoc
Wireless electronic Load	-	-	Provide by laboratory	-

3.5 Test location

Shenzhen Huaxia Testing Technology Co., Ltd,

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

3.6 Test Facility

- **A2LA (Certificate No. 4742.01)**

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4742.01.

- **FCC Registration No.: 522263**

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen 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. Registration No.:522263

3.7 Equipment list

Test Equipment	Manufacturer	Model No.	Instrument No.	Calibration Date	Calibration Due Date
Broadband Field Meter	Narda Safety Test Solutions GmbH	NBM-520	SB9873	2020/10/18	2021/10/17
Magnetic field probe	HIOKI	3470	SB9058/04	2020/12/14	2021/12/13

4 RF Exposure Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 Limits

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the nvironment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

TABLE 1—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 Exposures				
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
300–1500 .....	.....	.....	f/300	6
1500–100,000 .....	.....	.....	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
300–1500 .....	.....	.....	f/1500	30
1500–100,000 .....	.....	.....	1.0	30

Note 1: f = frequency in MHz ; *Plane-wave equivalent power density

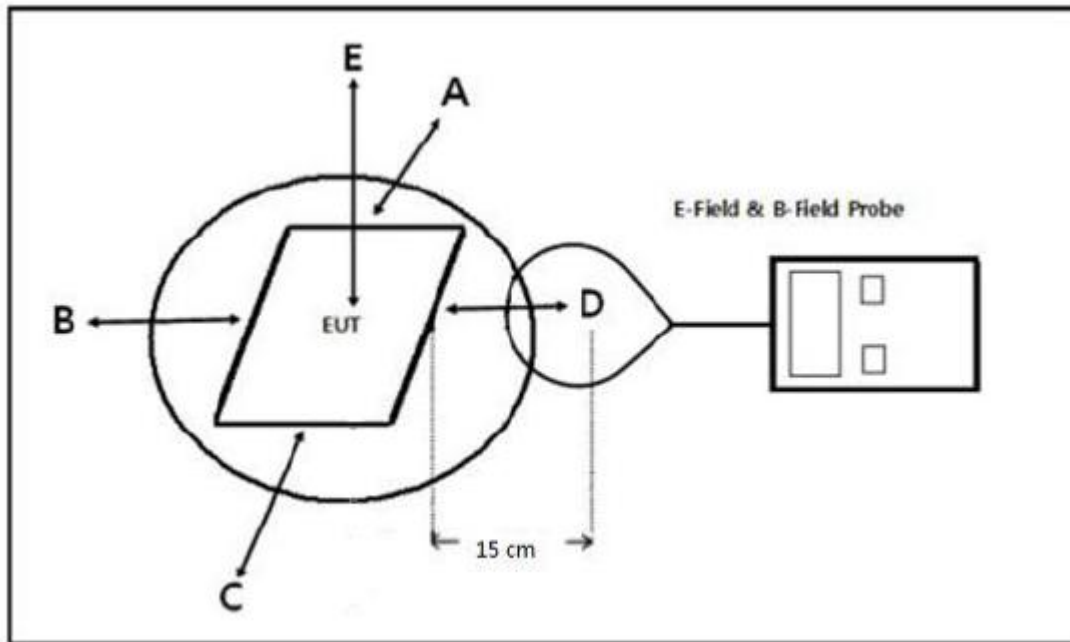
Note 2: For the applicable limit, see FCC 1.1310, 680106 D01 RF Exposure Wireless Charging Apps v03
 Note 3: Emissions between 100 kHz to 300 kHz should be assessed versus the limits at 300 kHz in Table 1 of Section 1.1310: 614 V/m and 1.63 A/m. A KDB inquiry is required to determine the applicable exposure limits below 100 kHz.

Note 4: The aggregate H-field strengths at 15 cm 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 .

4.1.2 Test Procedure

For devices designed for typical desktop applications, such a wireless charging pads, RF exposure evaluation should be conducted assuming a user separation distance of 20 cm(Top) and 15cm(Edge). E and H field strength measurements or numerical modeling may be used to demonstrate compliance. Measurements should be made from all sides and the top of the primary/client pair, with the 20 cm(Top) and 15cm(Edge) measured from the center of the probe(s) to the edge of the device.

4.1.3 Test Setup



Note: Position A: Front of EUT; Position B: Left of EUT; Position C: back of EUT; Position D: Right of EUT; Position E: Top of EUT(20 cm measure distance);

4.1.4 Test Results

The EUT does comply with item 5 KDB680106 D01 v03.

(1) Power transfer frequency is less than 1 MHz.

(Conform)

(2) Output power from each primary coil is less than or equal to 15 watts.

(Conform)

(3) The transfer system includes only single primary and secondary coils. This includes charging systems that may have multiple primary coils and clients that are able to detect and allow coupling only between individual pairs of coils.

(Conform)

(4) Client device is placed directly in contact with the transmitter.

(Conform)

(5) Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).

(Conform)

(6) The aggregate H-field strengths at 15 cm 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.

(Conform)

Test condition: Mode 10

E-field strength test result:

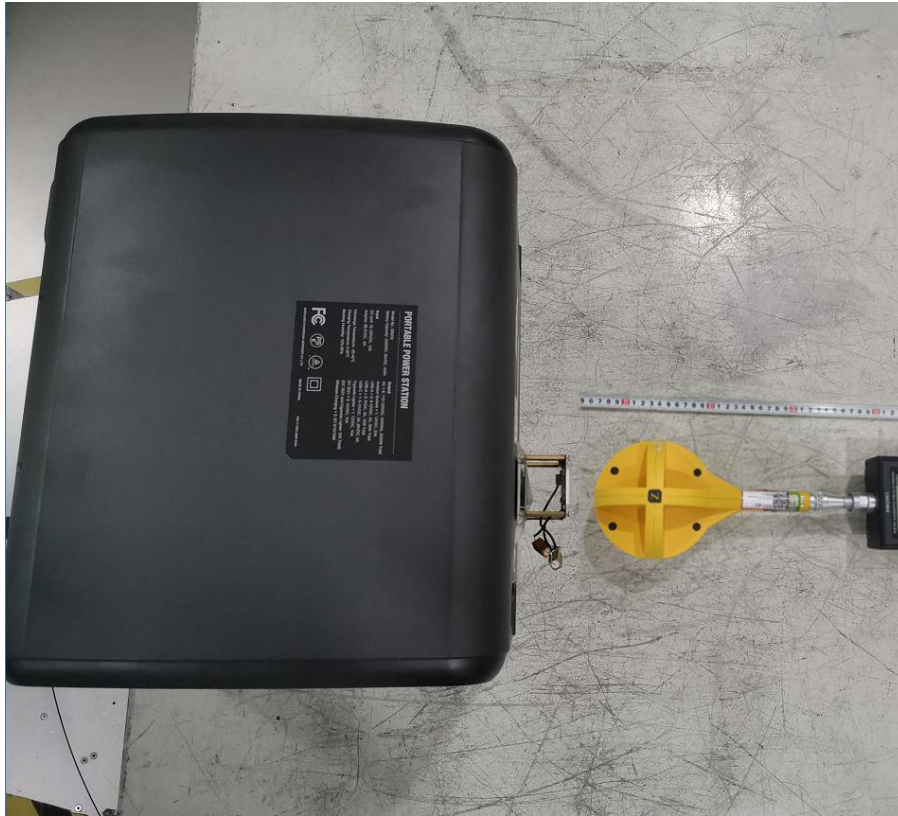
Frequency Range	Probe Position A (V/m)	Probe Position B (V/m)	Probe Position C (V/m)	Probe Position D (V/m)	Probe Position E (V/m)	Limit (V/m)
139kHz	2.68	3.15	2.48	3.08	2.49	614

H-field strength test result:

Frequency Range	Probe Position A (A/m)	Probe Position B (A/m)	Probe Position C (A/m)	Probe Position D (A/m)	Probe Position E (A/m)	Limit (A/m)
139kHz	0.57	0.74	0.62	0.68	0.43	1.63

APPENDIX A: PHOTOGRAPHS OF TEST SETUP

Test Model No.: EB200



----END OF REPORT----