



RF Exposure Report

For

Applicant Name:

Shenzhen Siyou Technology Co., Ltd

Address:

Room610,Block C,Jixin Building,No.89 Buji Road,Lianhua Community,Buji Street,Longgang District,Shenzhen

EUT Name:

Outdoor Mobile Power Supply

Brand Name:

N/A

Model Number:

4U-1218

Series Model Number:

4U-1221

Issued By

Company Name:

BTF Testing Lab (Shenzhen) Co., Ltd.

Address:

F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China

Report Number:

BTF240423R00102

Test Standards:

47 CFR Part 1 Subpart I Section 1.1310

FCC ID:

2BGP34U-1218

Test Conclusion:

Pass

Test Date:

2024-04-24 to 2024-05-27

Date of Issue:

2024-05-28

Prepared By:

Aria Zhang

Aria Zhang / Project Engineer

2024-05-28



 Ryan.CJ / EMC Manager

Date:

Approved By:

Date:

2024-05-28

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Revision History		
Version	Issue Date	Revisions Content
R_V0	2024-05-28	Original
<i>Note:</i>	<i>Once the revision has been made, then previous versions reports are invalid.</i>	

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1. Introduction

1.1 Identification of Testing Laboratory

Company Name:	BTF Testing Lab (Shenzhen) Co., Ltd.
Address:	F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Phone Number:	+86-0755-23146130
Fax Number:	+86-0755-23146130

1.2 Identification of the Responsible Testing Location

Test Location:	BTF Testing Lab (Shenzhen) Co., Ltd.
Address:	F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Description:	All measurement facilities used to collect the measurement data are located at F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
FCC Registration Number:	518915
Designation Number:	CN1330

1.3 Laboratory Condition

Ambient Temperature:	20°C to 25°C
Ambient Relative Humidity:	45% to 55%
Ambient Pressure:	100 kPa to 102 kPa

1.4 Announcement

- (1) The test report reference to the report template version v0.
- (2) The test report is invalid if not marked with the signatures of the persons responsible for preparing, reviewing and approving the test report.
- (3) The test report is invalid if there is any evidence and/or falsification.
- (4) This document may not be altered or revised in any way unless done so by BTF and all revisions are duly noted in the revisions section.
- (5) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
- (6) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.

2. Product Information

2.1 Application Information

Company Name:	Shenzhen Siyou Technology Co., Ltd
Address:	Room610,Block C,Jixin Building,No.89 Buji Road,Lianhua Community,Buji Street,Longgang District,Shenzhen

2.2 Manufacturer Information

Company Name:	Shenzhen Siyou Technology Co., Ltd
Address:	Room610,Block C,Jixin Building,No.89 Buji Road,Lianhua Community,Buji Street,Longgang District,Shenzhen

2.3 Factory Information

Company Name:	Shenzhen Siyou Technology Co., Ltd
Address:	Building D, No.8, Silian Huamao Industrial Park, Henggang Street, Longgang District, Shenzhen

2.4 General Description of Equipment under Test (EUT)

EUT Name:	Outdoor Mobile Power Supply
Test Model Number:	4U-1218
Series Model Name	4U-1221
Description of Model name differentiation	The function and appearance are the same, only the product size and the battery capacity used are different
product size(mm)	4U-1218:191.7*135.5*28.6 4U-1221:217.1*153.5*31.6

3. Test Requirement

KDB 680106 D01 RF Exposure Wireless Charging App v03

Human exposure to RF Low frequency emissions from portable devices (47 CFR § 2.1093) may be evaluated based on the MPE limits adopted by the FCC for electric and magnetic field strength and/or power density.

According to the item 5.2 of KDB 680106 D01v03:

TCB Workshop and combine the actual situation of the EUT, For the portable wireless charger, RF exposure evaluation should be made from all sides(six sides) of EUT, with the 0cm to 20cm measured from the center of the probe to the edge of the EUT, in 2cm minimum increment.

According to Calibration information and specification about EHP-200A, The Probe EHP-200A's sensitive elements center are 8mm below the external surface, and the dimensions is 92x92x109mm, so the actual field strengths need to be estimated for the positions that are not reachable. The Extrapolated Value Calculation Method please below).

E and H field strength measurements or numerical modelling may be used to demonstrate compliance.

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 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

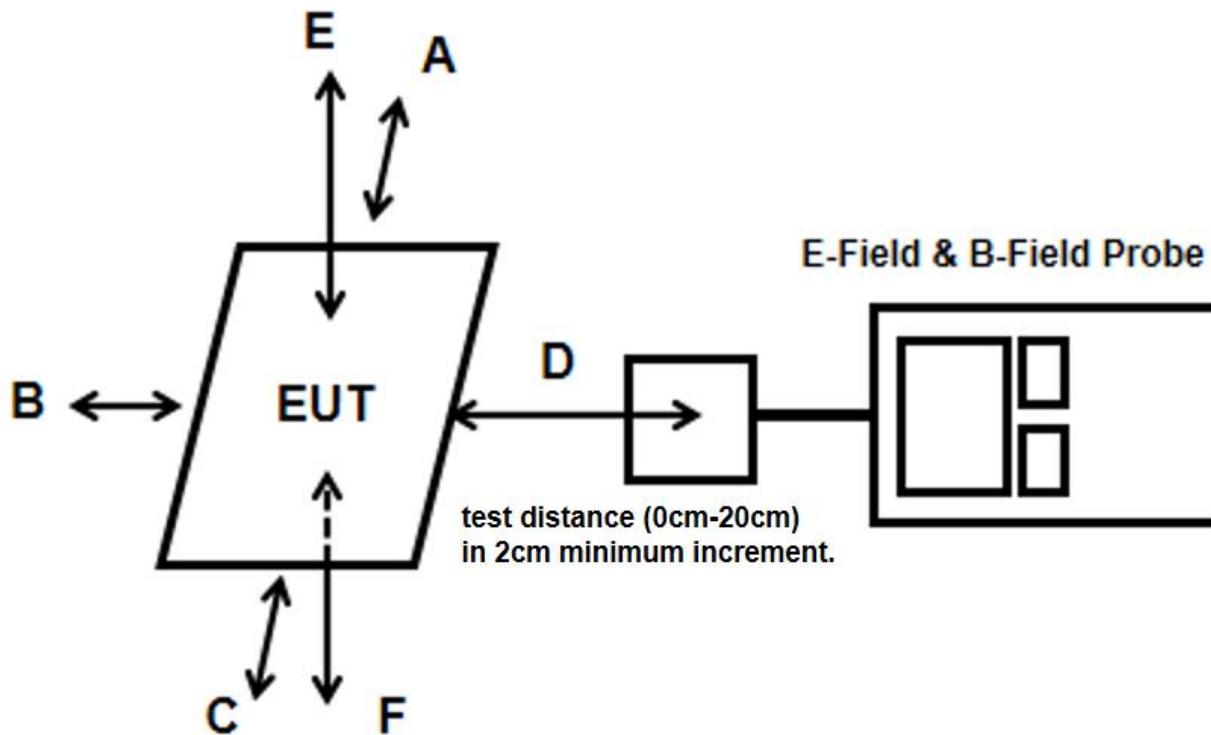
f = frequency in MHz * = Plane-wave equivalent power density

Test Equipment List

Test Equipment	Manufacturer	Model No.	Serial No.	Dimensions	Last Cal. (mm-dd-yy)	Next Cal. (mm-dd-yy)
Electric and Magnetic Field Analyzer	Narda	EHP-200A	180ZX11001	92*92*109mm	2024.3.27	2025.3.26

Test Mode

Test item	Test mode	Description
Radiated&Conducted Test cases	ANT1	Mode 1: AC/DC Adapter + EUT + Mobile Phone (Battery Status: <1%)
		Mode 2: AC/DC Adapter + EUT + Mobile Phone (Battery Status: <50%)
		Mode 3: AC/DC Adapter + EUT + Mobile Phone (Battery Status: <100%)
		Mode 4: EUT + Mobile Phone (Battery Status: <1%)
		Mode 5: EUT + Mobile Phone (Battery Status: <50%)
		Mode 6: EUT + Mobile Phone (Battery Status: <100%)

Test Setup

Note: Measurements should be made from all sides and the top of the primary/client pair, the test distance of A, B, C, D, E, F side is 0cm to 20cm.

- 1) The RF exposure test was performed in anechoic chamber.
- 2) The highest emission level was recorded and compared with limit as soon as measurement of each points (A, B, C, D, E, F) were completed.
- 3) The EUT was measured according to the dictates of KDB 680106 D01 v03.

3.1 Assessment Result

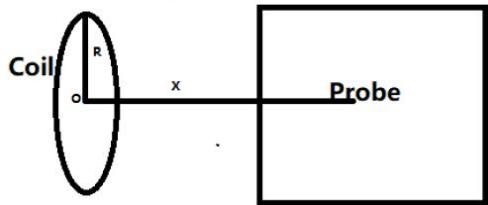
Note: All the mode have been tested, and only the worst case of mode are in the report.

And the result of test distance 2cm-20cm was measured value.

Estimated method for portable RF Exposure condition:

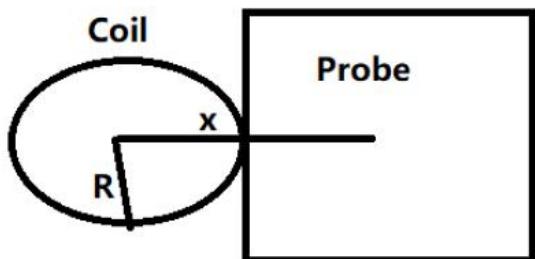
We use Biot-Savart formula theory to estimate the strength of the magnetic field that the measuring instrument cannot measure. According to Biot-Savart formula:

Top & Bottom Side:



$$B = \frac{\mu_0 * I * N * R^2}{2 * (R^2 + x^2)^{3/2}}$$

Front, left, right & rear Side:



$$B = \frac{\mu_0 * I * N}{2 * x}$$

B: means H-field value.

μ_0 is space permeability; $\mu_0 = 4\pi * 10^{-7}$:

I: A current element passing through a coil:

R: means the Radius of coil(According to provided Antenna specification: We can get the minimum R=0.021m);

Test Distance: The distance from the sensing element of the probe to the edge of the devicesurface
 x: means the center of the coil to the sensing elements of the probe. (For top & bottom side: x=test distance. For other side: x=test distance+R)

N: Number of turns, according to providing "Antenna specification" files: N=10

For validation purposes: If the value to show a 30% agreement between the mode and the (E- and/or H-field) probemeasurements for the two closest points to the device surface, and with 2cm increments. Then this extrapolation method is reasonable.

Note:

The percent ratio of agreement is the difference between the estimated and measured values divided by the average of the estimated and measured values.

Validation:

Test Distance(cm)	Top	Left	Right	Front	Rear	Bottom	Conclusion
	Unit: Agreement (%); H-field (A/m)						
Agreement- 2cm	12.40	18.56	26.85	21.82	25.74	13.11	Compliance (Within 30%)
2cm(estimated)	0.2569	0.0830	0.0942	0.0991	0.0478	0.2287	
2cm(measured)	0.2269	0.0689	0.0719	0.0796	0.0369	0.2006	

Test Distance(cm)	Top	Left	Right	Front	Rear	Bottom	Conclusion
	Unit: Agreement (%); H-field (A/m)						
Agreement- 2cm	9.03	28.24	24.50	24.44	23.50	14.49	Compliance (Within 30%)
4cm(estimated)	0.0770	0.0393	0.0386	0.0417	0.0248	0.0724	
4cm(measured)	0.0703	0.0296	0.0302	0.0326	0.0196	0.0626	

Mode	measuring distance (cm)	Measured H-Field Strength Values (A/m)						FCC H-Field Strength Limits (A/m)
		Test Position A	Test Position B	Test Position C	Test Position D	Test Position E	Test Position F	
Mode 1	0	0.6994	0.5128	0.5351	0.5924	0.2746	0.6183	1.63
Mode 1	2	0.2269	0.0689	0.0719	0.0796	0.0369	0.2006	1.63
Mode 1	4	0.0703	0.0252	0.0286	0.0301	0.0145	0.0626	1.63
Mode 1	6	0.0286	0.0168	0.0165	0.0178	0.0106	0.0269	1.63
Mode 1	8	0.0254	0.0133	0.0142	0.0156	0.0102	0.0224	1.63
Mode 1	10	0.0233	0.0124	0.0135	0.0138	0.0095	0.0196	1.63
Mode 1	12	0.0188	0.0110	0.0124	0.0126	0.0087	0.0175	1.63
Mode 1	14	0.0156	0.0093	0.0115	0.0113	0.0075	0.0145	1.63
Mode 1	16	0.0143	0.0085	0.0102	0.0104	0.0064	0.0124	1.63
Mode 1	18	0.0125	0.0067	0.0086	0.0093	0.0052	0.0107	1.63
Mode 1	20	0.0096	0.0042	0.0053	0.0087	0.0037	0.0087	1.63

3.2 Test Set-up Photo









Test Report Number: BTF240423R00102



BTF Testing Lab (Shenzhen) Co., Ltd.

F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street,
Bao'an District, Shenzhen, China

www.btf-lab.com

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