



Test Report

FCC ID: 2A4MT-N2002

Applicant: Shenzhen Zhenghaixin Technology Co., Ltd.
Address: Area 301A, No.7 Xiongyu Road, Tangxiachong Community, Yanluo Street, Baoan District, Shenzhen
Manufacturer: Shenzhen Zhenghaixin Technology Co., Ltd.
Address: Area 301A, No.7 Xiongyu Road, Tangxiachong Community, Yanluo Street, Baoan District, Shenzhen
EUT: Power Bank
Trade Mark: N/A
Model Number: N2002
Date of Receipt: Jan. 24, 2024
Test Date: Jan. 24, 2024 - Feb. 03, 2024
Date of Report: Feb. 03, 2024
Prepared By: Shenzhen DL Testing Technology Co., Ltd.
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This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Shenzhen DL Testing Technology Co., Ltd.



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Contents

1	General Description	5
1.1	Description of the EUT.....	5
1.2	Description of test modes	5
1.3	Description of support units	6
2	Measurement uncertainty	6
3	Test facilities and accreditations.....	7
3.1	Test laboratory	7
4	List of test equipment	8
5	Test result	9
5.1	Requirement	9
5.2	Test setup.....	10
5.3	Test Procedures.....	11
5.4	Test results.....	12
	Photographs of the Test Setup.....	20
	Photographs of the EUT	20

**Test Result Certification**

Applicant:	Shenzhen Zhenghaixin Technology Co., Ltd.
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Manufacturer:	Shenzhen Zhenghaixin Technology Co., Ltd.
Address:	Area 301A, No.7 Xiongyu Road, Tangxiachong Community, Yanluo Street, Baoan District, Shenzhen
Product description	
Product name:	Power Bank
Trademark:	N/A
Model name:	N2002
Series Model:	N/A
Standards:	FCC CFR 47 PART 1, § 1.1310 FCC CFR 47 PART 2, § 2.1093
Test method:	KDB 680106 D01 Wireless Power Transfer v04
Date of Test	
Date of test:	Jan. 24, 2024 - Feb. 03, 2024
Test result:	Pass



1 General Description

1.1 Description of the EUT

Product name:	Power Bank
Model name:	N2002
Series Model:	N/A
Model difference:	N/A
Electrical rating:	USB-C Input: 5V/3A, 9V/2A, 12V/1.5A USB-C Output: 5V/3A, 9V/2.22A, 12V/1.67A USB-C(Cable) Output: 5V/3A, 9V/2.22A, 12V/1.67A Lightning(Cable) Output: 5V/2.4A USB-A Output: 5V/3A, 9V/2A, 12V/1.5A Wireless Output: 3W Max. Total Output: 5V/3A Battery capacity: 20000mAH/3.85V/77Wh
Accessories:	Cable: USB-C to USB-C Cable 100cm
RF specification:	
Operation frequency:	115-205kHz
Modulation type:	MSK
Antenna type:	Coil

1.2 Description of test modes

All the test modes were carried out with the EUT in normal operation, the final test mode of the EUT was the worst test mode for emission test, which was shown in this report and defined as:

No.	Emission test modes
Mode1	Wireless Output(3W)
Mode2	Charging+Wireless Output(3W)
Mode3	Standby
Note: All of the listed test mode were tested, only the data of the worst mode (Mode1) is recorded in the report	



1.3 Description of support units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Support equipment list			
Description	Model	Serial No.	Manufacturer
XIAOMI Laptop Portable adapter(65W)	AD65G	/	XIAOMI
Apple	Series 6	/	Apple

2 Measurement uncertainty

Parameter	Expanded Uncertainty
Magnetic field measurement (9kHz~30MHz)	$\pm 7.8\%$
Electric field measurements (9kHz~30MHz)	$\pm 7.8\%$

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.



3 Test facilities and accreditations

3.1 Test laboratory

Test laboratory:	Shenzhen DL Testing Technology Co., Ltd.
Test site location:	101-201, Building C, Shuanghuan, No.8, Baoqing Road, Baolong Industrial Zone, Baolong Street, Longgang District, Shenzhen, Guangdong, China
FCC Test Firm Registration Number:	854456
Designation Number:	CN1307
IC Registered No.:	27485
CAB ID.:	CN0118



4 List of test equipment

Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
Electric and Magnetic Field Probe – Analyzer	Narda	EHP-200A	101166	June. 24, 2023	June. 25, 2024



5 Test result

5.1 Requirement

§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), except in the case of portable devices which shall be evaluated according to the provisions of FCC part 2.1093 of this chapter.

Table 1 to §1.1310(e)(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)
(i) 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
300-1500			f/300	<6
1500-100000			5	<6
(ii) 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
1500-100000			1.0	<30

f = frequency in MHz

* = Plane-wave equivalent power density

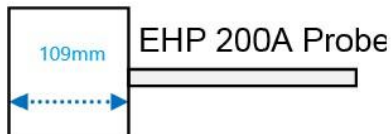
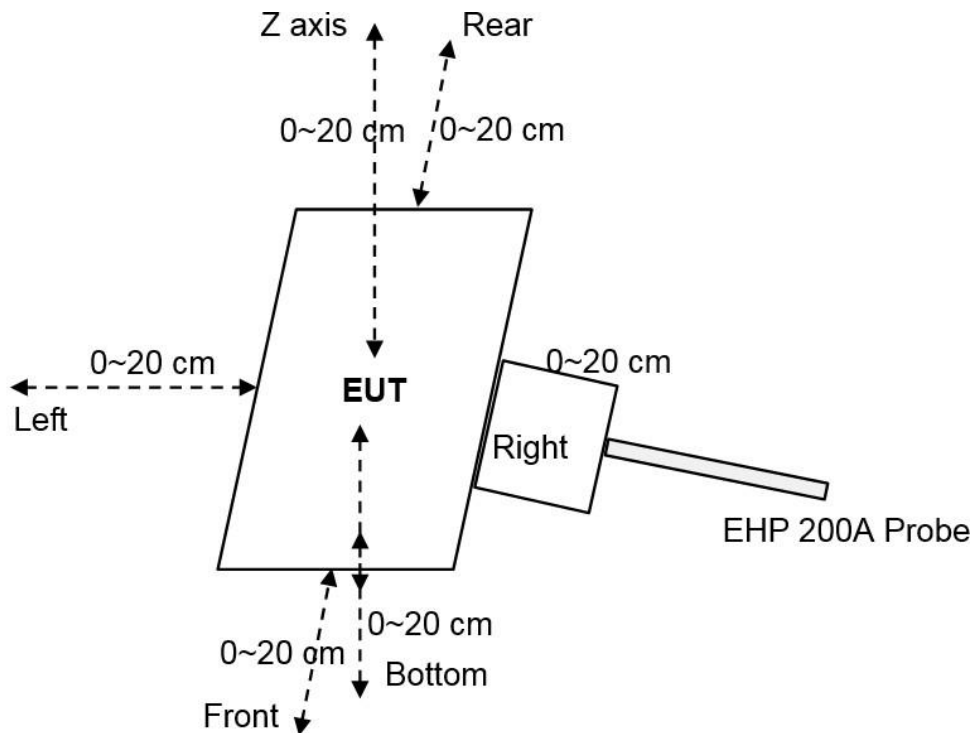
Note 1: Occupational/controlled exposure limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure.

Note 2: General population/uncontrolled exposure limits apply in situations in which the general public may be exposed, or in which persons who are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.



5.2 Test setup

For portable exposure conditions:



Notes: The EHP 200A Probe has a diameter of 10.9cm and a radius of 5.45cm.



5.3 Test Procedures

For portable exposure conditions:

- a. The RF exposure test was performed in anechoic chamber.
- b. Perform H-field measurements for each edge/top surface of the host/client pair at every 2 cm, starting from as close as possible out to 20 cm
- c. The highest emission level was recorded and compared with limit.

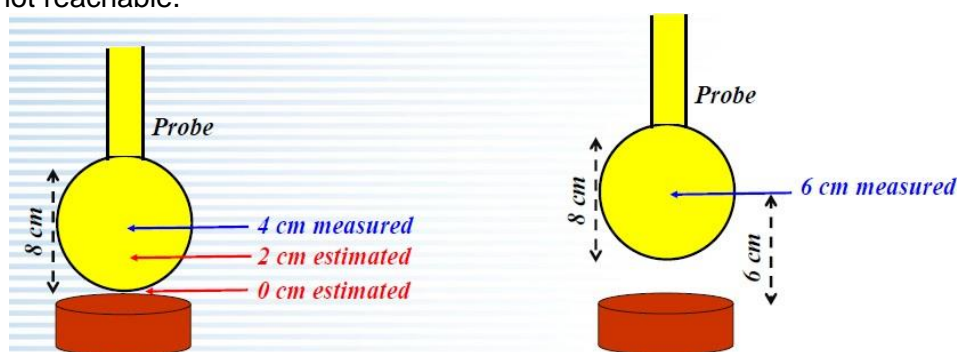
Notes: The EUT was setted to transmit continuously with the duty cycle of 100%.



5.4 Test results

For portable exposure condition: Note:

- (1). The portable test modes have covered the considerations of the mobile test, only record the test data of the portable conditions in this report.
- (2) Operating modes with client device (1 %, 50%, 99% battery status of client device) have been test, only show the data of worst case of 1% battery status of client device.
- (3) 20-2cm is the actual test value, and 0 cm is the estimated value.
- (4) Perform H-field/E-field measurements are taken along all three axes the device from 0cm~20cm in 2cm minimum increment for each edge surface of the host/client pair. If the center of the probe sensing element is more than 5mm from the probe outer edge, the field strengths need to be estimated for the positions that are not reachable.



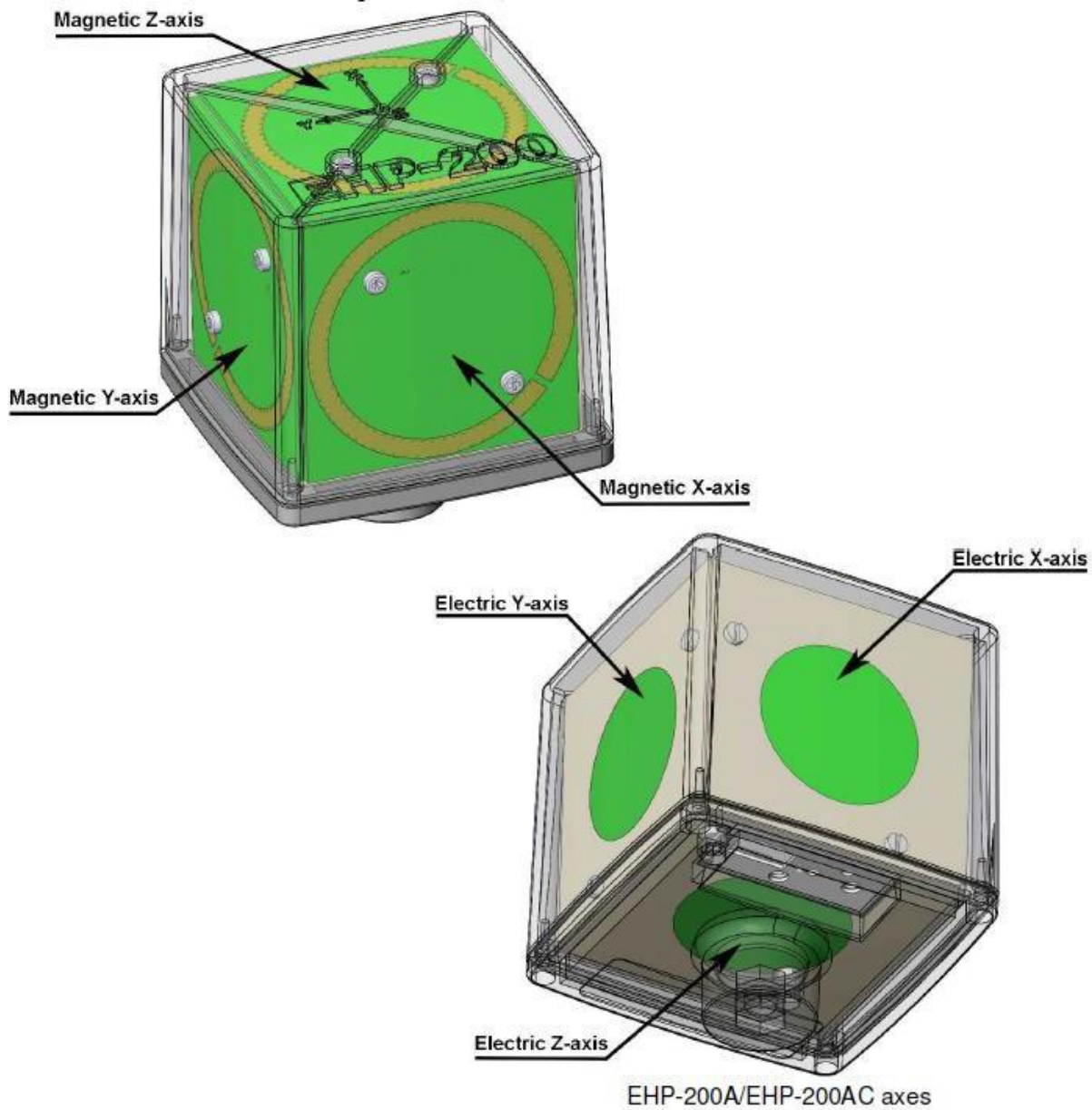
*Example of probe measurements in points close to the device surface:
estimates compared with measurements at 4 and 6 cm provide validation*

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 0cm field strengths need to be estimated for the positions that are not reachable. The Extrapolated Value Calculation Method please below). And the result of test distance 2cm~20cm was measured value.

Probe	Length	Width	Height
	109mm	92mm	92mm



Note: EUT is a loop/coil emitting structure, so E-field not required. Just recorded the H-field value.

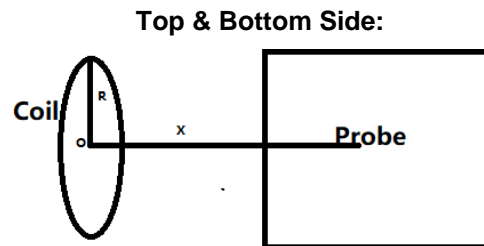


The sensitive elements are located approximately 8 mm below the external surface

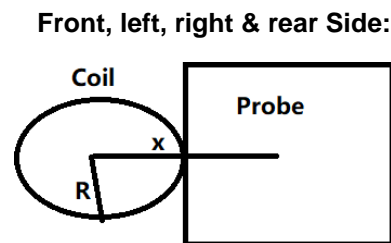


(5) Estimated method for portable RF Exposure condition:

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:



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



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

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 $R=38/2=19\text{mm}=0.019\text{m}$);

Test Distance: The distance from the sensing element of the probe to the edge of the device surface.

x: means the center of the coil to the sensing elements of the probe. (For top & bottom side: $x=\text{test distance}$; For other side: $x=\text{test distance}+R$)

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

(6) For validation purposes: If the value to show a **30% agreement** between the mode and the (E- and/or H-field) probe measurements 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:

Magnetic Field Emissions							
Test Distance(cm)	Top	Left	Right	Rear	Front	Bottom	Conclusion
	Unit: Agreement (%); H-field (A/m)						
Agreement -2cm	18.66	26.11	28.44	25.26	15.27	15.93	Compliance (Within 30%)
2cm(estimated)	0.4222	0.1632	0.1833	0.1562	0.1305	0.3357	
2cm(measured)	0.3504	0.1253	0.1377	0.1213	0.1124	0.2862	

Magnetic Field Emissions							
Test Distance(cm)	Top	Left	Right	Rear	Front	Bottom	Conclusion
	Unit: Agreement (%); H-field (A/m)						
Agreement -2cm	16.84	18.41	23.64	11.12	27.65	26.71	Compliance (Within 30%)
4cm(estimated)	0.1208	0.0566	0.0676	0.0505	0.0498	0.1061	
4cm(measured)	0.1023	0.0472	0.0533	0.0453	0.0374	0.0813	



Test condition 1: Mode1 operating mode with client device (1 % battery status of client device)
-estimated value: 0cm

Estimated value for H-Filed Strength at 0 cm from the edges surrounding the EUT (A/m)

Antenna	Probe Position	H-field (A/m)		
		Measurement	Limit	Max. Percentage (%)
1	Z axis	1.0753	1.63	73.11%
	Left	1.0851		
	Right	1.1915		
	Front	1.0433		
	Rear	0.9754		
	Bottom	0.8733		

Test condition 2: Mode1 operating mode with client device (1 % battery status of client device)
- Test distance: 2cm

Antenna	Probe Position	H-field (A/m)		
		Measurement	Limit	Max. Percentage (%)
1	Z axis	0.3546	1.63	21.48%
	Left	0.1263		
	Right	0.1351		
	Front	0.1233		
	Rear	0.1144		
	Bottom	0.2866		



Test condition 3: Mode1 operating mode with client device (1 % battery status of client device)
- Test distance 4cm

Antenna	Probe Position	H-field (A/m)		
		Measurement	Limit	Max. Percentage (%)
1	Z axis	0.1153	1.63	6.81%
	Left	0.0435		
	Right	0.0463		
	Front	0.0418		
	Rear	0.0484		
	Bottom	0.0863		

Test condition 4: Mode1 operating mode with client device (1 % battery status of client device)
- Test distance 6cm

Antenna	Probe Position	H-field (A/m)		
		Measurement	Limit	Max. Percentage (%)
1	Z axis	0.0413	1.63	6.27%
	Left	0.0264		
	Right	0.0246		
	Front	0.0268		
	Rear	0.0256		
	Bottom	0.0364		

Test condition 5: Mode1 operating mode with client device (1 % battery status of client device)
- Test distance 8cm

Antenna	Probe Position	H-field (A/m)		
		Measurement	Limit	Max. Percentage (%)
1	Z axis	0.0453	1.63	5.76%
	Left	0.0254		
	Right	0.0216		
	Front	0.0132		
	Rear	0.018		
	Bottom	0.0364		



Test condition 6: Mode1 operating mode with client device (1 % battery status of client device)
- Test distance 10cm

Antenna	Probe Position	H-field (A/m)		
		Measurement	Limit	Max. Percentage (%)
1	Z axis	0.0453	1.63	5.17%
	Left	0.0234		
	Right	0.0216		
	Front	0.0135		
	Rear	0.0153		
	Bottom	0.0334		

Test condition 7: Mode1 operating mode with client device (1 % battery status of client device)
- Test distance 12cm

Antenna	Probe Position	H-field (A/m)		
		Measurement	Limit	Max. Percentage (%)
1	Z axis	0.0316	1.63	4.74%
	Left	0.0133		
	Right	0.0154		
	Front	0.0133		
	Rear	0.0154		
	Bottom	0.0233		

Test condition 8: Mode1 operating mode with client device (1 % battery status of client device)
- Test distance 14cm

Antenna	Probe Position	H-field (A/m)		
		Measurement	Limit	Max. Percentage (%)
1	Z axis	0.0343	1.63	4.50%
	Left	0.0134		
	Right	0.0115		
	Front	0.0132		
	Rear	0.0143		
	Bottom	0.0234		

**Test condition 9: Mode1 operating mode with client device (1 % battery status of client device)****- Test distance 16cm**

Antenna	Probe Position	H-field (A/m)		
		Measurement	Limit	Max. Percentage (%)
1	Z axis	0.0353	1.63	4.11%
	Left	0.0134		
	Right	0.0146		
	Front	0.0133		
	Rear	0.0144		
	Bottom	0.0232		

Test condition 10: Mode1 operating mode with client device (1 % battery status of client device)**- Test distance 18cm**

Antenna	Probe Position	H-field (A/m)		
		Measurement	Limit	Max. Percentage (%)
1	Z axis	0.0343	1.63	4.07%
	Left	0.0134		
	Right	0.0146		
	Front	0.0132		
	Rear	0.0123		
	Bottom	0.0234		

Test condition 11: Mode1 operating mode with client device (1 % battery status of client device)**- Test distance 20cm**

Antenna	Probe Position	H-field (A/m)		
		Measurement	Limit	Max. Percentage (%)
1	Z axis	0.0313	1.63	3.83%
	Left	0.0134		
	Right	0.0156		
	Front	0.0133		
	Rear	0.0145		
	Bottom	0.0253		



Photographs of the Test Setup

Portable exposure conditions(0cm)

Front



Left



Right



Rear



Top



Below





Photographs of the EUT

See the Appendix - EUT Photos.

----End of Report----