

TEST REPORT

Reference No...... : WTX23X11243517W002
FCC ID : 2A8YA-NW5000
Applicant : SYSMAX Innovations Co., Ltd.
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Guangdong,China
Manufacturer : Sysmax Power Technology.LLC
Address : Room 401, Building 2, No. 2, Huahong East Street, Gaopu Town, Dongguan
City, Guangdong Province
Product Name : Carbon Fiber Magnetic Wireless Power Bank
Model No...... : NW5000
Standards : KDB 680106 D01 V04
Date of Receipt sample : 2023-11-15
Date of Test..... : 2023-11-15 to 2023-12-14
Date of Issue : 2023-12-14
Test Report Form No. : WTX_KDB 680106_D01_V03W
Test Result..... : **Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

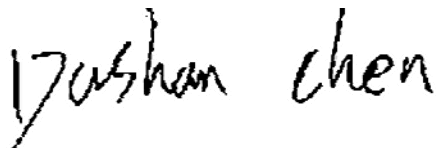
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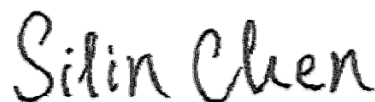
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Report version

Version No.	Date of issue	Description
Rev.00	2023-12-14	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

General Description of EUT	
Product Name:	Carbon Fiber Magnetic Wireless Power Bank
Trade Name:	NITECORE
Model No.:	NW5000
Adding Model(s):	/
Battery Capacity	/
<i>Note: The test data is gathered from a production sample, provided by the manufacturer.</i>	

Technical Characteristics of EUT	
Frequency Range:	110~205kHz
Modulation Type:	FSK
Antenna Type:	Coil Antenna
Antenna Gain	0dBi
Rated Voltage:	Battery Capacity: 5000mAh(19.25Wh) Type C Input: 5V, 9V,12V Type C output: 5V, 9V,12V Wireless Charger: 5W/7.5W/10W/15W Total Output: 20W Max
Rated Current:	Input : 2.4A/ 2A/1.5A Output : 2.4A/ 2.22A/1.67A
Rated Power:	Wireless Output : 5W, 7.5W, 10W,15W Total Output: 20W Max
<i>Note The Antenna Gain is provided by the customer and can affect the validity of results.</i>	

1.2 Auxiliary Equipment List and Details

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
/	/	/	/

1.3 Test Equipment List and Details

Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
ELECTRIC AND MAGNETIC FIELD ANALYZER	Narda	EHP-200AC	180ZX10226	2021-05-20	2024-05-19
Note: The deviation response is 0.8dB.					

2. RF Exposure Test Report

2.1 Standard Applicable

According to §1.1310 system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

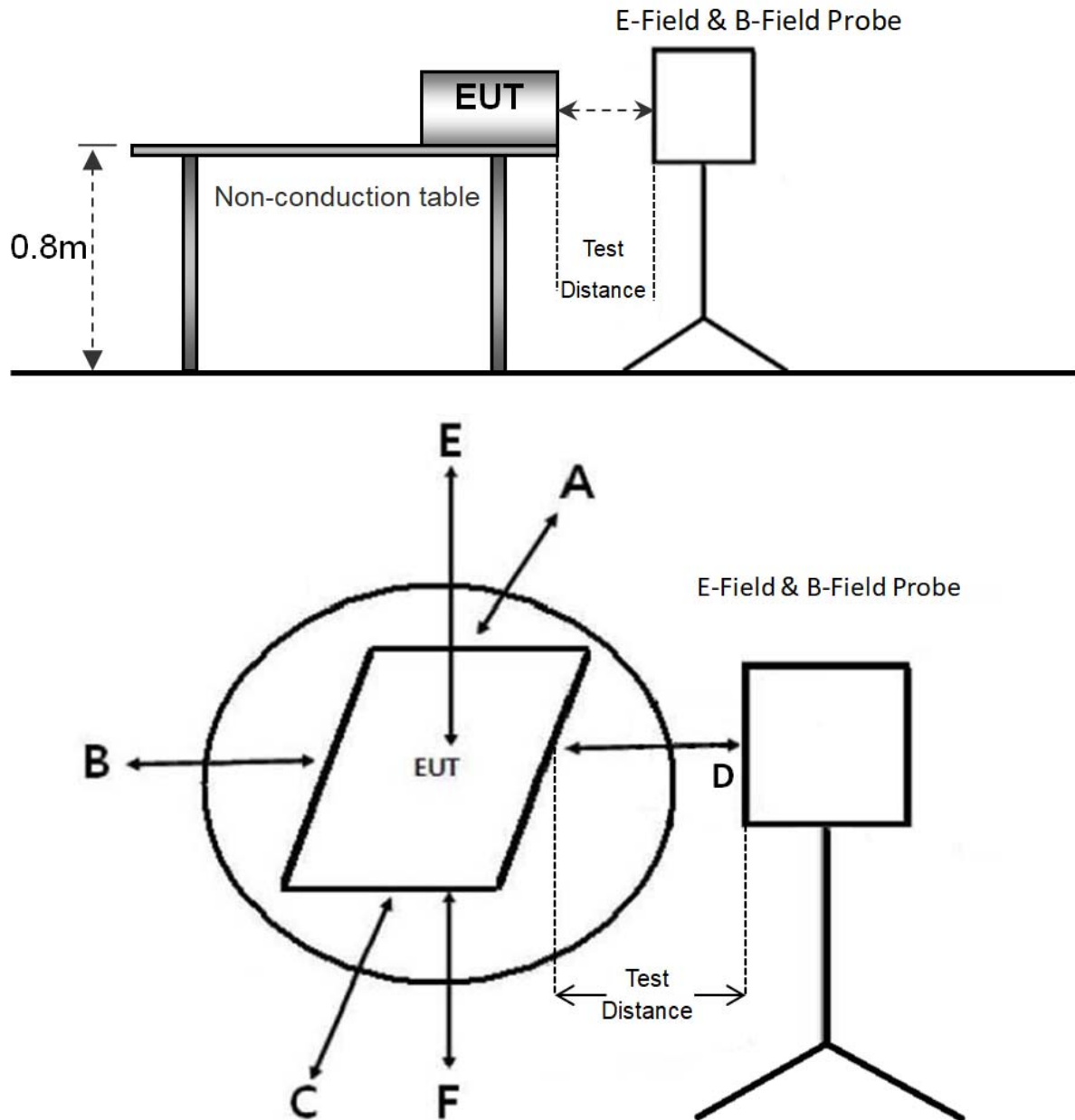
Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f ²	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	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

2.2 Test Conditions

Test Mode	Description	Remark
AC adapter Mode:		
TM1	Wireless Charging	Input : 5V/2.4A, 9V2A, 12V1.5A Wireless Output : 5W
Battery Mode(2cm):		
TM2	Wireless Charging	Wireless Output : 5W, 10W, 15W
Battery Mode(4cm):		
TM3	Wireless Charging	Wireless Output : 5W, 10W, 15W
Battery Mode(6cm):		
TM4	Wireless Charging	Wireless Output : 5W, 10W, 15W
Battery Mode(8cm):		
TM5	Wireless Charging	Wireless Output : 5W, 10W, 15W
Battery Mode(10cm):		
TM6	Wireless Charging	Wireless Output : 5W, 10W, 15W
Battery Mode(12cm):		
TM7	Wireless Charging	Wireless Output : 5W, 10W, 15W
Battery Mode(14cm):		
TM8	Wireless Charging	Wireless Output : 5W, 10W, 15W
Battery Mode(16cm):		
TM9	Wireless Charging	Wireless Output : 5W, 10W, 15W
Battery Mode(18cm):		
TM10	Wireless Charging	Wireless Output : 5W, 10W, 15W
Battery Mode(20cm):		
TM11	Wireless Charging	Wireless Output : 5W, 10W, 15W
Note: For test AC Adapter, the device is designed for desktop, the test should be performed on each points (only A, B, C, D, E) at test distance (15 cm). For test by Battery, the device is designed for portable, the test should be performed on each points (A, B, C, D, E, F) at test distance (2 ~20cm). The EUT was tested with empty load, half load, and full load, and recorded the worst mode (full load) data in the report.		
Measurement Distance:	0~20 cm	

2.3 Test Procedure



- Probe Model: EHP-200AC; The probe sensor is 8 mm below the surface
- The measurement probe was placed at test distance, which is between the edge of the charger and the edge of probe.
- E- and H-field data are taken along all three axes the device, from 0 cm to 20 cm, in 2 cm minimum increment measured from the edge of the device, with one axis coincident with the axis of the main coil.
- The highest emission level was recorded at the measurement points (A, B, C, D, E, F).
- The EUT was measured according to the distance of KDB 680106 D01 v04.

2.4 Test Result

The EUT complies with item 5.2 of KDB 680106 D01 v04

1. The power transfer frequency is below 1 MHz.
Yes, the device operates in the frequency range from 110 kHz to 205 kHz.
2. The output power from each transmitting element (e.g., coil) is less than or equal to 15 watts.
Yes, the maximum output power of the primary coil is equal to 15W.
3. A client device providing the maximum permitted load is placed in physical contact with the transmitter (i.e., the surfaces of the transmitter and client device enclosures need to be in physical contact)
Yes, the surfaces of the transmitter and client device enclosures has be in physical contact.
4. Only § 2.1091-Mobile exposure conditions apply (i.e., this provision does not cover § 2.1093-Portable exposure conditions).
No, it also supports portable exposure conditions.
5. The E-field and H-field strengths, at and beyond 20 cm surrounding the device surface, are demonstrated to be less than 50% of the applicable MPE limit, per KDB 447498, Table 1. These measurements shall be taken along the principal axes of the device, with one axis oriented along the direction of the estimated maximum field strength, and for three points per axis or until a 1/d (inverse distance from the emitter structure) field strength decay is observed. Symmetry considerations may be used for test reduction purposes. The device shall be operated in documented worst-case compliance scenarios (i.e., the ones that lead to the maximum field components), and while all the radiating structures (e.g., coils or antennas) that by design can simultaneously transmit are energized at their nominal maximum power.
Yes, The EUT field strength levels are less than 50% of the MPE limit, refer to test list.
6. For systems with more than one radiating structure, the conditions specified in (5) must be met when the system is fully loaded (i.e., clients absorbing maximum power available), and with all the radiating structures operating at maximum power at the same time, as per design conditions. If the design allows one or more radiating structures to be powered at a higher level while other radiating structures are not powered, then those cases must be tested as well.
Yes, The EUT field strength levels are less than 50% of the MPE limit, refer to test list; and the coils can't transmitted simultaneous.

Test Mode: TM1

Test distance: 15 cm

Electric Field Emissions			
Test Position	Measure Value (V/m)	Limit(V/m)	50% Limit (V/m)
Point E	0.0496	614	307
Point F	0.0517	614	307
Point A	0.0486	614	307
Point B	0.0392	614	307
Point C	0.0380	614	307
Point D	0.0359	614	307
Magnetic Field Emissions			
Test Position	Measure Value (A/m)	Limit(A/m)	50% Limit (A/m)
Point E	0.0367	1.63	0.815
Point F	0.0352	1.63	0.815
Point A	0.0389	1.63	0.815
Point B	0.0410	1.63	0.815
Point C	0.0496	1.63	0.815
Point D	0.0474	1.63	0.815

Test Mode: TM2

Test distance: 2cm

Electric Field Emissions			
Test Position	Measure Value (V/m)	Limit(V/m)	50% Limit (V/m)
Point E	0.2762	614	307
Point F	0.0995	614	307
Point A	0.1343	614	307
Point B	0.1256	614	307
Point C	0.1279	614	307
Point D	0.2218	614	307
Magnetic Field Emissions			
Test Position	Measure Value (A/m)	Limit(A/m)	50% Limit (A/m)
Point E	0.1810	1.63	0.815
Point F	0.1471	1.63	0.815
Point A	0.0978	1.63	0.815
Point B	0.1015	1.63	0.815
Point C	0.0960	1.63	0.815
Point D	0.1029	1.63	0.815

Test Mode: TM3

Test distance: 4cm

Electric Field Emissions			
Test Position	Measure Value (V/m)	Limit(V/m)	50% Limit (V/m)
Point E	0.1067	614	307
Point F	0.0402	614	307
Point A	0.0527	614	307
Point B	0.0489	614	307
Point C	0.0491	614	307
Point D	0.0845	614	307
Magnetic Field Emissions			
Test Position	Measure Value (A/m)	Limit(A/m)	50% Limit (A/m)
Point E	0.0716	1.63	0.815
Point F	0.0600	1.63	0.815
Point A	0.0376	1.63	0.815
Point B	0.0393	1.63	0.815
Point C	0.0360	1.63	0.815
Point D	0.0417	1.63	0.815

Test Mode: TM4

Test distance: 6cm

Electric Field Emissions			
Test Position	Measure Value (V/m)	Limit(V/m)	50% Limit (V/m)
Point E	0.0571	614	307
Point F	0.0215	614	307
Point A	0.0295	614	307
Point B	0.0268	614	307
Point C	0.0272	614	307
Point D	0.0463	614	307
Magnetic Field Emissions			
Test Position	Measure Value (A/m)	Limit(A/m)	50% Limit (A/m)
Point E	0.0392	1.63	0.815
Point F	0.0313	1.63	0.815
Point A	0.0200	1.63	0.815
Point B	0.0225	1.63	0.815
Point C	0.0201	1.63	0.815
Point D	0.0229	1.63	0.815

Test Mode: TM5

Test distance: 8cm

Electric Field Emissions			
Test Position	Measure Value (V/m)	Limit(V/m)	50% Limit (V/m)
Point E	0.0326	614	307
Point F	0.0319	614	307
Point A	0.0378	614	307
Point B	0.0356	614	307
Point C	0.0337	614	307
Point D	0.0382	614	307
Magnetic Field Emissions			
Test Position	Measure Value (A/m)	Limit(A/m)	50% Limit (A/m)
Point E	0.0275	1.63	0.815
Point F	0.0386	1.63	0.815
Point A	0.0375	1.63	0.815
Point B	0.0362	1.63	0.815
Point C	0.0415	1.63	0.815
Point D	0.0385	1.63	0.815

Test Mode: TM6

Test distance: 10cm

Electric Field Emissions			
Test Position	Measure Value (V/m)	Limit(V/m)	50% Limit (V/m)
Point E	0.0172	614	307
Point F	0.0186	614	307
Point A	0.0181	614	307
Point B	0.0173	614	307
Point C	0.0183	614	307
Point D	0.0195	614	307
Magnetic Field Emissions			
Test Position	Measure Value (A/m)	Limit(A/m)	50% Limit (A/m)
Point E	0.0258	1.63	0.815
Point F	0.0392	1.63	0.815
Point A	0.0361	1.63	0.815
Point B	0.0389	1.63	0.815
Point C	0.0426	1.63	0.815
Point D	0.0417	1.63	0.815

Test Mode: TM7

Test distance: 12cm

Electric Field Emissions			
Test Position	Measure Value (V/m)	Limit(V/m)	50% Limit (V/m)
Point E	0.0159	614	307
Point F	0.0195	614	307
Point A	0.0172	614	307
Point B	0.0153	614	307
Point C	0.0148	614	307
Point D	0.0176	614	307
Magnetic Field Emissions			
Test Position	Measure Value (A/m)	Limit(A/m)	50% Limit (A/m)
Point E	0.0296	1.63	0.815
Point F	0.0415	1.63	0.815
Point A	0.0382	1.63	0.815
Point B	0.0411	1.63	0.815
Point C	0.0459	1.63	0.815
Point D	0.0428	1.63	0.815

Test Mode: TM8

Test distance: 14cm

Electric Field Emissions			
Test Position	Measure Value (V/m)	Limit(V/m)	50% Limit (V/m)
Point E	0.0168	614	307
Point F	0.0209	614	307
Point A	0.0165	614	307
Point B	0.0178	614	307
Point C	0.0159	614	307
Point D	0.0194	614	307
Magnetic Field Emissions			
Test Position	Measure Value (A/m)	Limit(A/m)	50% Limit (A/m)
Point E	0.0317	1.63	0.815
Point F	0.0429	1.63	0.815
Point A	0.0396	1.63	0.815
Point B	0.0415	1.63	0.815
Point C	0.0488	1.63	0.815
Point D	0.0397	1.63	0.815

Test Mode: TM9

Test distance: 16cm

Electric Field Emissions			
Test Position	Measure Value (V/m)	Limit(V/m)	50% Limit (V/m)
Point E	0.0186	614	307
Point F	0.0216	614	307
Point A	0.0184	614	307
Point B	0.0194	614	307
Point C	0.0167	614	307
Point D	0.0223	614	307
Magnetic Field Emissions			
Test Position	Measure Value (A/m)	Limit(A/m)	50% Limit (A/m)
Point E	0.0346	1.63	0.815
Point F	0.0408	1.63	0.815
Point A	0.0417	1.63	0.815
Point B	0.0432	1.63	0.815
Point C	0.0493	1.63	0.815
Point D	0.0385	1.63	0.815

Test Mode: TM10

Test distance: 18cm

Electric Field Emissions			
Test Position	Measure Value (V/m)	Limit(V/m)	50% Limit (V/m)
Point E	0.0195	614	307
Point F	0.0182	614	307
Point A	0.0195	614	307
Point B	0.0207	614	307
Point C	0.0189	614	307
Point D	0.0249	614	307
Magnetic Field Emissions			
Test Position	Measure Value (A/m)	Limit(A/m)	50% Limit (A/m)
Point E	0.0305	1.63	0.815
Point F	0.0385	1.63	0.815
Point A	0.0376	1.63	0.815
Point B	0.0416	1.63	0.815
Point C	0.0451	1.63	0.815
Point D	0.0324	1.63	0.815

Test Mode: TM11

Test distance: 20cm

Electric Field Emissions			
Test Position	Measure Value (V/m)	Limit(V/m)	50% Limit (V/m)
Point E	0.0215	614	307
Point F	0.0196	614	307
Point A	0.0225	614	307
Point B	0.0243	614	307
Point C	0.0185	614	307
Point D	0.0267	614	307
Magnetic Field Emissions			
Test Position	Measure Value (A/m)	Limit(A/m)	50% Limit (A/m)
Point E	0.0268	1.63	0.815
Point F	0.0353	1.63	0.815
Point A	0.0327	1.63	0.815
Point B	0.0385	1.63	0.815
Point C	0.0392	1.63	0.815
Point D	0.0287	1.63	0.815

Using Biot-Savart Law, the value of 0cm can be estimated through the test results of 2cm:

Distance: 0cm

Electric Field Emissions			
Test Position	Valuation(V/m)	Limit(V/m)	50% Limit (V/m)
Point E	1.1223	614	307
Point F	0.4045	614	307
Point A	1.0358	614	307
Point B	0.9684	614	307
Point C	0.9866	614	307
Point D	1.7100	614	307
Magnetic Field Emissions			
Test Position	Valuation(A/m)	Limit(A/m)	50% Limit (A/m)
Point E	0.7353	1.63	0.815
Point F	0.5979	1.63	0.815
Point A	0.7538	1.63	0.815
Point B	0.7824	1.63	0.815
Point C	0.7400	1.63	0.815
Point D	0.7932	1.63	0.815

Using Biot-Savart Law, the value of 2cm can be estimated through the test results of 4cm:

Distance: 2cm

Electric Field Emissions			
Test Position	Valuation(V/m)	Limit(V/m)	50% Limit (V/m)
Point E	0.3478	614	307
Point F	0.1310	614	307
Point A	0.1757	614	307
Point B	0.1630	614	307
Point C	0.1637	614	307
Point D	0.2817	614	307
Magnetic Field Emissions			
Test Position	Valuation(A/m)	Limit(A/m)	50% Limit (A/m)
Point E	0.2334	1.63	0.815
Point F	0.1956	1.63	0.815
Point A	0.1253	1.63	0.815
Point B	0.1310	1.63	0.815
Point C	0.1200	1.63	0.815
Point D	0.1390	1.63	0.815

Agreement Ratio

Distance: 2cm

Electric Field Emissions				
Test Position	Measure Value (V/m)	Valuation(V/m)	Agreement ratio	Limit
Point E	0.2762	0.3478	22.95%	30%
Point F	0.0995	0.1310	27.33%	30%
Point A	0.1343	0.1757	26.71%	30%
Point B	0.1256	0.1630	25.92%	30%
Point C	0.1279	0.1637	24.55%	30%
Point D	0.2218	0.2817	23.79%	30%
Magnetic Field Emissions				
Test Position	Measure Value (A/m)	Valuation(A/m)	Agreement ratio	Limit
Point E	0.1810	0.2334	25.29%	30%
Point F	0.1471	0.1956	28.30%	30%
Point A	0.0978	0.1253	24.65%	30%
Point B	0.1015	0.1310	25.38%	30%
Point C	0.0960	0.1200	22.22%	30%
Point D	0.1029	0.1390	29.85%	30%

2.5 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
Electric Field Emissions	Radiated	±1.56 (V/m)
Magnetic Field Emissions	Radiated	±0.08(A/m)

2.6 Test Photos



APPENDIX PHOTOGRAPHS

Please refer to “ANNEX”

***** END OF REPORT *****