

FCC TEST REPORT

FCC ID: 2AP2N-BOX5000W

On Behalf of

Shenzhen Esorun Technology Co.,LTD

Wireless Power Bank

Model No.: BOX5000W

Prepared for : Shenzhen Esorun Technology Co.,LTD

425(E02), No. 5 Golf Avenue, Guangpei Community, Guanlan Address

Street, Longhua District, Shenzhen, China

Prepared By : Shenzhen Alpha Product Testing Co., Ltd.

Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, Address

518103, Shenzhen, Guangdong, China

Report Number : A1912138-C01-R04 Date of Receipt
Date of Test
Date of Report
Version Number

December 13, 2019
December 13, 2019
December 17, 2019
Control of Report
Control of Receipt
Control of Rec

: December 13, 2019-December 17, 2019

TABLE OF CONTENTS

1.	Test Result Summary	5
2.	General Information	6
	2.1. DESCRIPTION OF DEVICE (EUT)	6
	2.2. ACCESSORIES OF DEVICE (EUT)	
	2.3. TESTED SUPPORTING SYSTEM DETAILS	7
	2.4. BLOCK DIAGRAM OF CONNECTION BETWEEN EUT AND SIMULATORS	7
	2.5. DESCRIPTION OF TEST MODES	7
	2.6. TEST CONDITIONS	7
	2.7. TEST FACILITY	8
	2.8. MEASUREMENT UNCERTAINTY	8
	2.9. TEST EQUIPMENT LIST	9
3.	Test Results and Measurement Data	10
	3.1. CONDUCTED EMISSION	10
	3.2. RADIATED SPURIOUS EMISSION MEASUREMENT	13
4.	Antenna Requirements	19
	4.1. LIMIT	19
	4.2. RESULT	19
5.	Photos of test setup	20
6.	Photographs of EUT	

Ella liang

TEST REPORT DECLARATION

: Shenzhen Esorun Technology Co.,LTD Applicant

425(E02), No. 5 Golf Avenue, Guangpei Community, Guanlan Address

Street, Longhua District, Shenzhen, China

: Shenzhen Esorun Technology Co.,LTD Manufacturer

425(E02), No. 5 Golf Avenue, Guangpei Community, Guanlan Address

Street, Longhua District, Shenzhen, China

EUT Description Wireless Power Bank

> (A) Model No. : BOX5000W (B) Trademark : ESORUN

Measurement Standard Used:

FCC CFR Title 47 Part 15 Subpart C

ANSI C63.10:2013

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed full responsibility for the accuracy and completeness of test. Also, this report shows that the EUT is technically compliant with the FCC CFR Title 47 Part 15 Subpart C requirements.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Ella Liang Tested by (name + signature)....:

Project Engineer

Simple Guan Approved by (name + signature).....:

Project Manager

Date of issue..... December 17, 2019

Revision History

Revision	Issue Date	Revisions	Revised By
V0	December 17, 2019	Initial released Issue	Simple Guan

1. Test Result Summary

Requirement	CFR 47 Section	Result
Antenna requirement	§15.203	PASS
AC Power Line Conducted Emission	§15.207	PASS
Spurious Emission	§15.209(a) and 15.209(f)	PASS

Note:

- 1. PASS: Test item meets the requirement.
- 2. Fail: Test item does not meet the requirement.
- 3. N/A: Test case does not apply to the test object.
- 4. The test result judgment is decided by the limit of test standard.

2. General Information

2.1. Description of Device (EUT)

EUT Name : Wireless Power Bank

Model No. : BOX5000W

DIFF. : N/A

Trademark : ESORUN

Power supply : Input : DC 5V/2.0A

Wireless Output : DC 5V/1A

USB Output: 5V/2A

Operation frequency : 125-205KHz

Modulation : MSK

Antenna Type : Coil Antenna

Software version : V3.01

Hardware version : V3

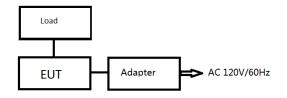
2.2. Accessories of Device (EUT)

Accessories1 : /
Manufacturer : /
Model : /
Ratings : /

2.3. Tested Supporting System Details

No.	Description	Manufacturer	Model	Serial Number	Certification or DOC
1	Wireless Load	JIDUOMANG TECHNOLOGY CO.,LTD	Jiduobang-004		
2	Adapter	SHENZHEN BIAOYUAN TECHNOLOGY CO.,LTD	BY-075W01M		SDOC

2.4. Block Diagram of connection between EUT and simulators



2.5. Description of Test Modes

Equipment under test was operated during the measurement under the following conditions:

No.	Test model	Radiated emission	Conducted emission
1	Load Empty	1	1
2	Half Load	/	/
3	Full Load	*	*

Modulation Type: CW (Continuous Wave)

Note: All test modes were pre-tested, but we only recorded the worst case in this report (injlient is worst case mode.).

2.6. Test Conditions

Items	Required	Actual	
Temperature range:	15-35 ℃	24℃	
Humidity range:	25-75%	56%	
Pressure range:	86-106kPa	98kPa	

2.7. Test Facility

Shenzhen Alpha Product Testing Co., Ltd Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen, Guangdong, China

June 21, 2018 File on Federal Communication Commission Registration Number: 293961

July 15, 2019 Certificated by IC Registration Number: CN0085

2.8. Measurement Uncertainty

(95% confidence levels, k=2)

Item	MU	Remark
Uncertainty for Conducted Emission Test	2.74dB	
Uncertainty for Radiation Emission test in 3m chamber	2.13 dB	Polarize: V
(below 30MHz)	2.57dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber	3.77dB	Polarize: V
(30MHz to 1GHz)	3.80dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber	4.16dB	Polarize: H
(1GHz to 25GHz)	4.13dB	Polarize: V
Uncertainty for radio frequency	5.4×10 ⁻⁸	
Uncertainty for conducted RF Power	0.37dB	

2.9. Test Equipment List

Equipment	Manufacture	Model No.	Serial No.	Last cal.	Cal Interval
9*6*6 anechoic CHENYU 9*6*6		N/A	2019.09.06	1Year	
Spectrum analyzer	ROHDE&SCHW ARZ	FSU	1166.1660.26	2019.09.06	1Year
Spectrum analyzer	Agilent	N9020A	MY499100060	2019.09.05	1Year
Receiver	ROHDE&SCHW ARZ	ESR	1316.3003K03-10208 2-Wa	2019.09.06	1Year
Receiver	R&S	ESCI	101165	2019.09.05	1Year
Bilog Antenna	Schwarzbeck	VULB 9168	VULB9168-438	2018.04.13	2Year
Loop Antenna	SCHWARZBEC K	FMZB 1519B	00059	2019.09.07	2Year
Cable	Resenberger	N/A	No.1	2019.09.05	1Year
Cable	SCHWARZBEC K	N/A	No.2	2019.09.05	1Year
Cable	SCHWARZBEC K	N/A	No.3	2019.09.05	1Year
Pre-amplifier	HP	HP8347A	2834A00455	2019.09.05	1Year
Pre-amplifier	Agilent	8449B	3008A02664	2019.09.05	1Year
Temperature controller	Terchy	MHQ	120	2019.09.20	1Year
L.I.S.N.#1	Schwarzbeck	NSLK8126	8126-466	2019.09.05	1Year
L.I.S.N.#2	ROHDE&SCHW ARZ	ENV216	101043	2019.09.05	1 Year
20db Attenuator	ICPROBING	IATS1	82347	2019.09.20	1 Year

3. Test Results and Measurement Data

3.1. Conducted Emission

3.1.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.207					
Test Method:	ANSI C63.10:2013					
Frequency Range:	150 kHz to 30 MHz					
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto					
Limits:	Frequency range (MHz) Limit (dBuV) 0.15-0.5 Quasi-peak Average 0.5-5 56 46 5-30 60 50					
	Reference Plane					
Test Setup:	Adapter E.U.T Adapter Filter AC power EMI Receiver Remark E.U.T: Equipment Under Test LISN Line Impedence Stabilization Network					
Test Procedure:	 The E.U.T is connected to an adapter through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement. 					
Test Result:	PASS					

3.1.2. Test data

Please refer to following diagram for individual

Report No.: A1912138-C01-R04

Test Mode : Full Load

Test Results : PASS

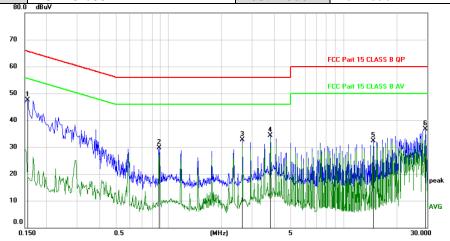
Note: The test results are listed in next pages.

This mode is worst case mode, so this report only reflected the worst mode.

If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector and quasi-peak detector need not be carried out.

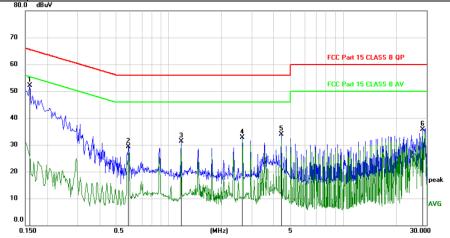
If the limits for the measurement with the average detector are met when using a receiver with a quasi-peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector need not be carried out.

EUT Description	Wireless Power Bank	Model No.	BOX5000W
Temperature	24°C	Humidity	56%
Pol	Line	Test date	2019/12/16
Test Voltage	AC 120V/60Hz	Test mode	Full Load



No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margir	n	
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1 *	0.1560	37.58	9.94	47.52	65.67	-18.15	peak	
2	0.8820	19.80	9.96	29.76	56.00	-26.24	peak	
3	2.6430	22.80	9.92	32.72	56.00	-23.28	peak	
4	3.8160	24.39	9.96	34.35	56.00	-21.65	peak	
5	14.8230	21.91	10.33	32.24	60.00	-27.76	peak	
6	29.3400	25.98	10.64	36.62	60.00	-23.38	peak	

Pol Neutral



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margir	n		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment	
1	*	0.1590	42.11	9.94	52.05	65.52	-13.47	peak		
2		0.5880	19.48	9.92	29.40	56.00	-26.60	peak		
3		1.1760	21.49	9.89	31.38	56.00	-24.62	peak		
4		2.6430	22.73	9.92	32.65	56.00	-23.35	peak		
5		4.4130	23.98	10.00	33.98	56.00	-22.02	peak		
6		28.4970	25.15	10.60	35.75	60.00	-24.25	peak		

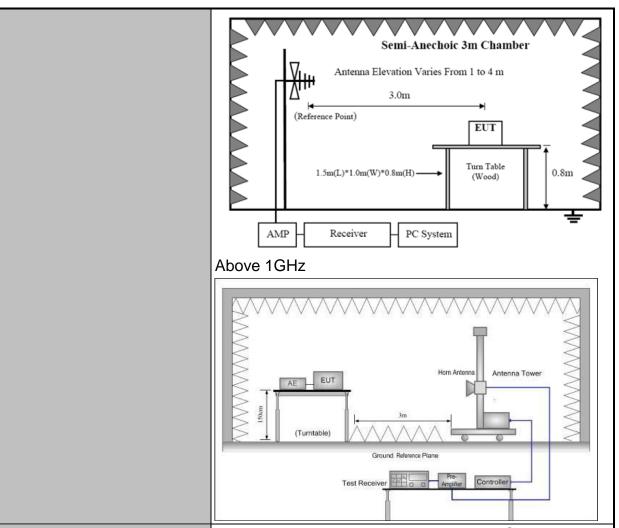
^{*:}Maximum data x:Over limit !:over margin

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

3.2. Radiated Spurious Emission Measurement

3.2.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.209									
Test Method:	ANSI C63.10: 2013									
Frequency Range:	9 kHz to 25 GHz									
Measurement Distance:	3 m									
Antenna Polarization:	Horizontal & Vertical									
	Frequency	Dete	Petector RBW		VBW		Remark			
	9kHz- 150kHz	Quasi-	•		1kHz		si-peak Value			
Receiver Setup:	150kHz- 30MHz	Quasi-	pea	k 9kHz	30kHz	Quas	si-peak Value			
Neceiver Setup.	30MHz-1GHz	Quasi-	nea	k 100KHz	300KHz	Quas	si-peak Value			
		Pea		1MHz	3MHz		eak Value			
	Above 1GHz	Pea	ak	1MHz	10Hz	Ave	erage Value			
	Frequen	су		Field Stre	-	Measurement				
	0.009-0.490				(microvolts/meter) 2400/F(KHz)		Distance (meters) 300			
	0.490-1.7			24000/F(30			
	1.705-3			30	,		30			
	30-88			100		3				
	88-216	6	150				3			
Limit:	216-96			200			3			
	Above 960			500		3				
		1			1					
	Fraguenav			ld Strength	Measure		Detector			
	Frequency			ovolts/meter)	Distan (meter		Detector			
				500	3	.0)	Average			
	Above 1GHz	Z	5000		3		Peak			
	For radiated emissions below 30MHz									
Test setup:	Distance = 3m Computer Pre -Amplifier O.8m Receiver									
	30MHz to 10	JI 14								



Test Procedure:

1. For the radiated emission test below 1GHz: The EUT was placed on a turntable with 0.8 meter above ground. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high PASS filter are used for the test in order to get better signal level. For the radiated emission test above 1GHz: Place the measurement antenna on a turntable with 1.5 meter above ground, which is away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final

	measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane. 2. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level 3. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported. 4. Use the following spectrum analyzer settings: (1) Span shall wide enough to fully capture the emission being measured;
	 (2) Set RBW=100 kHz for f < 1 GHz; VBW ≥RBW; Sweep = auto; Detector function = peak; Trace = max hold; (3) Set RBW = 1 MHz, VBW= 3MHz for f □ 1 GHz for peak measurement. For average measurement: VBW = 10 Hz, when
	duty cycle is no less than 98 percent. VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
Test results:	PASS

3.2.2. Test Data

Please refer to following diagram for individual

Frequency : 9KHz~30MHz

Test Mode : Full Load

Test Results : PASS

Note: 1. The test results are listed in next pages.

2. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the quasi-peak detector need not be carried out.

Freq.	Reading	Antenna Factor	Cable loss	Amp Factor	Result	Limit	Margin	Detect	State
(MHz)	(dBuV/m)	dB/m	dB	dB	(dBuV/m)	(dBuV/m) at 3 m	(dB)	or	P/F
0.125	75.26	48.34	0.16	29.87	93.89	125.67	-31.78	PK	PASS
0.125	62.64	48.34	0.16	29.87	81.27	105.67	-24.40	AV	PASS
0.175	73.33	48.34	0.16	29.87	91.96	122.74	-30.78	PK	PASS
0.175	62.52	48.34	0.16	29.87	81.15	102.74	-21.59	AV	PASS
0.205	72.36	48.38	0.17	29.89	91.02	121.37	-30.35	PK	PASS
0.205	65.57	48.38	0.17	29.89	84.23	101.37	-17.14	AV	PASS
0.35	57.31	48.44	0.19	29.89	76.05	116.72	-40.68	PK	PASS
0.35	52.10	48.44	0.19	29.89	70.84	96.72	-25.88	AV	PASS
0.45	60.04	48.47	0.19	29.89	78.81	114.54	-35.73	PK	PASS
0.45	49.71	48.47	0.19	29.89	68.48	94.54	-26.06	AV	PASS
1.928	25.02	49.12	0.2	29.94	44.40	69.5	-25.10	QP	PASS
1.920	33.67	49.12	0.2	29.94	53.05	69.5	-16.45	QP	PASS

Frequency : 30MHz~1000MHz Range Test Mode Full Load **PASS** Test Results

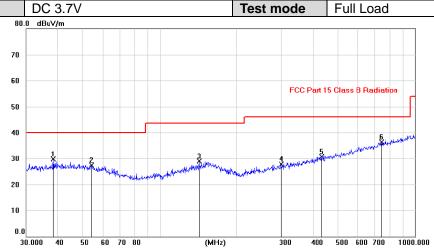
Note: 1. The test results are listed in next pages.

2. This mode is worst case mode, so this report only reflected the worst mode.

3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the quasi-peak detector need not be carried out.

Frequency Range	:	Above 1GHz			
EUT	:	/	 Test Date	:	1
M/N	:	/	 Temperature	:	1
Test Engineer	:	/	 Humidity	:	/
Test Mode	:	/			
Test Results	:	N/A			

1. The highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. So the frequency rang above Note: 1GHz radiation test not applicable.



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		38.3967	15.52	14.26	29.78	40.00	-10.22	peak			
2		54.3562	13.68	13.64	27.32	40.00	-12.68	peak			
3	,	142.6992	14.34	14.49	28.83	43.50	-14.67	peak			
4	2	299.9725	13.71	14.05	27.76	46.00	-18.24	peak			
5	4	132.5457	13.55	17.07	30.62	46.00	-15.38	peak			
6	*	739.6604	14.04	22.35	36.39	46.00	-9.61	peak			

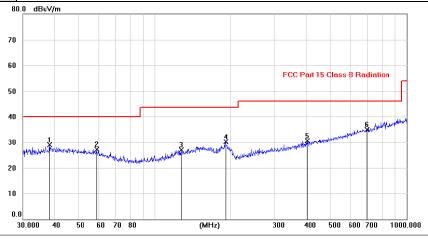
Pol Horizontal

EUT Description

Temperature

Test Voltage

Pol



No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		38.3967	14.60	14.26	28.86	40.00	-11.14	peak			
2		58.8959	13.84	13.26	27.10	40.00	-12.90	peak			
3		127.6086	13.43	13.42	26.85	43.50	-16.65	peak			
4		191.3253	18.80	11.34	30.14	43.50	-13.36	peak			
5		402.1908	14.28	16.25	30.53	46.00	-15.47	peak			
6	*	695.6360	13.25	21.70	34.95	46.00	-11.05	peak			

^{*:}Maximum data x:Over limit !:over margin

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

4. Antenna Requirements

4.1. Limit

15.203 requirement:

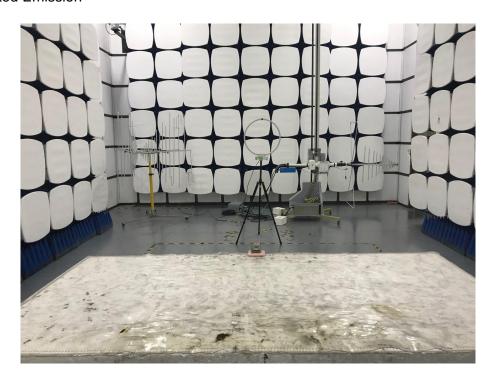
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

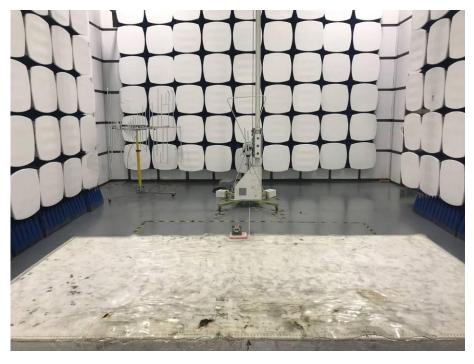
4.2. Result

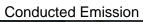
The antenna is coil antenna which permanently attached. It complies with the standard requirement.

5. Photos of test setup

Radiated Emission









6. Photographs of EUT













