

	TEST REPOR	RT							
FCC ID:	2AYT3-PS200								
Test Report No::	TCT210915E044								
Date of issue::	Sep. 29, 2021								
Testing laboratory:	SHENZHEN TONGCE TESTII	NG LAB							
Testing location/ address:	TCT Testing Industrial Park Fuqiao 5th Industrial Zone, Fuhai Street, Bao'an District Shenzhen, Guangdong, 518103, People's Republic of China								
Applicant's name:	SHENZHEN POWEROAK NE	SHENZHEN POWEROAK NEWENER CO., LTD							
Address::	Room 701-3, Building B, CADRE Building, Tongsha Road, Nanshan District, Shenzhen City, Guangdong Province, P.R. China								
Manufacturer's name:	SHENZHEN POWEROAK NEWENER CO., LTD								
Address::	Room 701-3, Building B, CADRE Building, Tongsha Road, Nanshan District, Shenzhen City, Guangdong Province, P.R. China								
Standard(s):	FCC CFR Title 47 Part 15 Sub	ppart C							
Test item description:	PORTABLE POWER STATIO	N C							
Trade Mark:	N/A								
Model/Type reference:	PS200								
Rating(s):	Refer to EUT description of pa	ige 3 (C)							
Date of receipt of test item	Sep. 15, 2021								
Date (s) of performance of test:	Sep. 15, 2021 ~ Sep. 29, 2021								
Tested by (+signature):	: Brave Zeng								
Check by (+signature):	Beryl Zhao	Buy SETTOTION							
Approved by (+signature):	Tomsin	Tomsin Jones 33							

General disclaimer:

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Hotline: 400-6611-140 Tel: 86-755-27673339 Fax: 86-755-27673332 http://www.tct-lab.com



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1. General Product Information

1.1.EUT description

Test item description:	PORTABLE POWER STATION
Model/Type reference:	PS200
Sample Number:	TCT210915E044-0101
Operation Frequency:	122.28kHz - 157.37kHz
Modulation Technology:	Load modulation
Antenna Type:	Inductive loop coil Antenna
Rating(s):	Battery Capacity: DC 51.2 V, 40 Ah, 2048 Wh DC port Input: DC 10-145 V, 15 A Adapter Input: DC 58.8 V, 8 A Output: AC *6: AC 100-110 V, 50/ 60 Hz, 2000 W Total; AC 110-120 V, 50/ 60 Hz, 2100 W Total Aviation sockets *1: DC 12 V, 30 A USB-A *2 Output: DC 5-12 V, 3 A *2, 2.18 W *2; USB-A *2 Output: DC 5 V, 3 A, 15 W Total USB-C *1 Output: DC 5-15 V, 3 A; DC 20 V, 5 A, 100 W Cigarette Lighter *1: DC 12 V, 10 A DC 5521 *2: DC 12 V,10 A Total (DC 5521 and Cigarette Lighter 10 A, Total) Wireless Charging *2: 5/ 7.5 /10 /15 W *2 POWER SUPPLY Model: T500-588A800-00 POWER SUPPLY Input: AC 100-240 V, 50/ 60 Hz, 7.5 A Max POWER SUPPLY Output: DC 58.8 V, 8 A

Note: The antenna gain listed in this report is provided by applicant, and the test laboratory is not responsible for this parameter.

1.2.Model(s) list

None.



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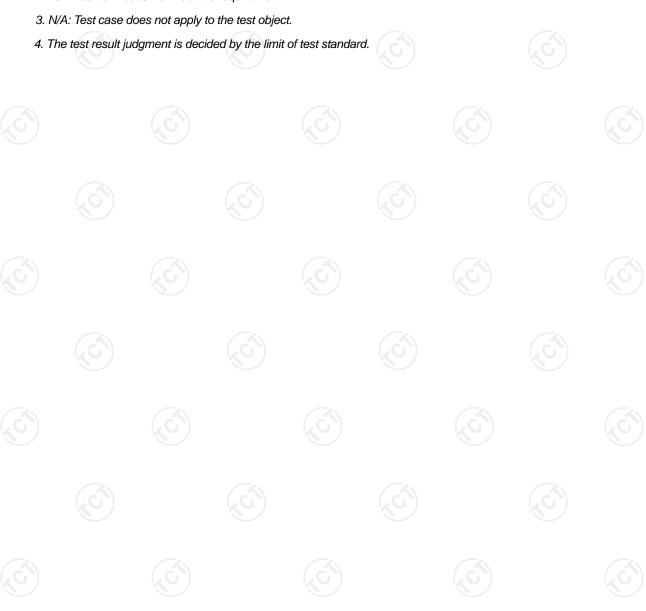


2. Test Result Summary

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

Note:

- 1. PASS: Test item meets the requirement.
- 2. Fail: Test item does not meet the requirement.





3. General Information

3.1. Test environment and mode

Operating Environment:								
Condition Conducted Emission Radiated Emission								
Temperature:	23.1 °C	24.3 °C						
Humidity:	52 % RH	51 % RH						
Atmospheric Pressure:	1010 mbar	1010 mbar						
Test Mode:								
Engineering mode: Keep the EUT in continuous transmitting by select channel and modulations. The worst case(Full Load) was used to test.								

The sample was placed 0.8m & 1.5m for the measurement below & above 1GHz above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case(Z axis) are shown in Test Results of the following pages.

3.2. 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.

Equipment	Model No.	Serial No.	FCC ID	Trade Name	
Mobile Phone	MQ972LL/A	C39V67SHJCM0	/	Apple	
Mobile Phone	SM-G9350	R28HA2ER3GT	1	SAMSUNG	

Note:

- 1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
- 2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

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4. Facilities and Accreditations

4.1. Facilities

The test facility is recognized, certified, or accredited by the following organizations:

FCC - Registration No.: 645098

SHENZHEN TONGCE TESTING LAB

Designation Number: CN1205

The testing lab has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

• IC - Registration No.: 10668A-1

SHENZHEN TONGCE TESTING LAB

CAB identifier: CN0031

The testing lab has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

4.2. Location

SHENZHEN TONGCE TESTING LAB

Address: TCT Testing Industrial Park Fuqiao 5th Industrial Zone, Fuhai Street, Bao'an

District Shenzhen, Guangdong, 518103, People's Republic of China

TEL: +86-755-27673339

4.3. Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	± 3.10 dB
2	RF power, conducted	± 0.12 dB
3	Spurious emissions, conducted	± 0.11 dB
4	All emissions, radiated(<1 GHz)	± 4.56 dB
5	All emissions, radiated(1 GHz - 18 GHz)	± 4.22 dB
6	All emissions, radiated(18 GHz- 40 GHz)	± 4.36 dB



5. Test Results and Measurement Data

5.1. Antenna requirement

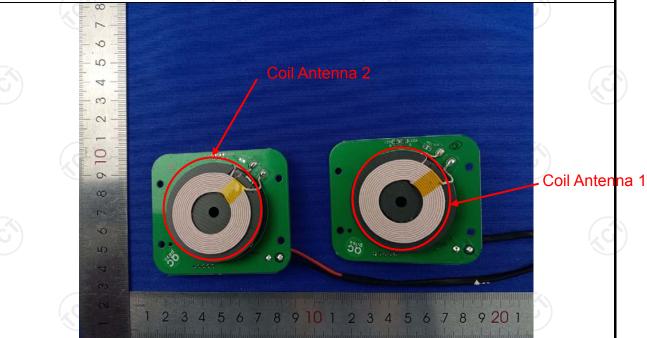
FCC Part15 C Section 15.203 **Standard requirement:**

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.

E.U.T Antenna:

The antenna is inductive loop coil antenna which permanently attached.





5.2. Conducted Emission

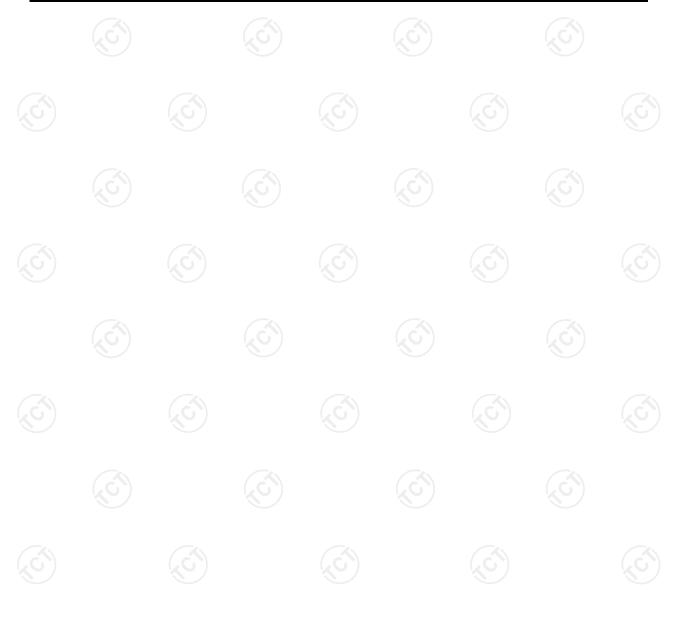
5.2.1. Test Specification

Test Requirement:	FCC Part15 C Section	15 207	KO						
•									
Test Method:	ANSI C63.10:2013								
Frequency Range:	150 kHz to 30 MHz	<u>(C)</u>	((C))						
Receiver setup:	RBW=9 kHz, VBW=30	kHz, Sweep time	e=auto						
Limits:	Frequency range (MHz) Quasi-peak Average 0.15-0.5 66 to 56* 56 to 46* 0.5-5 56 46 5-30 60 50								
Test Setup:	Adapter Filter AC power E.U.T Adapter Test table/Insulation plane Remark E.U.T. Equipment Under Test LISN: Line Impedence Stabilization Network								
Test Mode:	Test table height=0.8m Charging + Transmittir	ng Mode							
Test Procedure:	1. The E.U.T is connermoded impedance stabilized provides a 500hm/s measuring equipme 2. The peripheral device power through a Lacoupling impedance refer to the block photographs). 3. Both sides of A.C. conducted interfered emission, the relative the interface cables ANSI C63.10: 2013	zation network 50uH coupling in nt. ces are also conn- ISN that provides with 50ohm terr diagram of the line are checkence. In order to fi e positions of equals must be change	(L.I.S.N.). This appedance for the ected to the main a 500hm/50uH mination. (Please test setup and ed for maximum aipment and all of ged according to						
Test Result:	PASS								



5.2.2. Test Instruments

Cond	Conducted Emission Shielding Room Test Site (843)											
Equipment	Manufacturer	Model	Calibration Due									
EMI Test Receiver	R&S	ESCI3	100898	Jul. 07, 2022								
Line Impedance Stabilisation Newtork(LISN)	Schwarzbeck	NSLK 8126 8126453		Mar. 11, 2022								
Line-5	TCT	CE-05	N/A	Jul. 07, 2022								
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A								

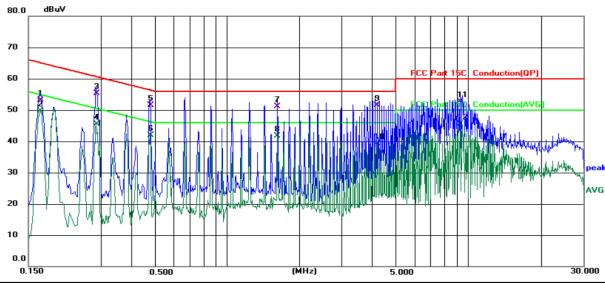




5.2.3. Test data

Please refer to following diagram for individual

Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



Site 844 Shielding Room

Phase: L1

Temperature: 23.1 (°C)

Humidity: 52 %

Limit: FCC Part 15C Conduction(QP)

Power: AC 120 V/60 Hz

No. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1685	43.61	9.59	53.20	65.03	-11.83	QP	
2	0.1685	40.09	9.59	49.68	55.03	-5.35	AVG	
3	0.2859	46.07	9.33	55.40	60.64	-5.24	QP	
4	0.2859	36.14	9.33	45.47	50.64	-5.17	AVG	
5	0.4779	42.39	9.21	51.60	56.38	-4.78	QP	
6	0.4779	32.71	9.21	41.92	46.38	-4.46	AVG	
7	1.6220	41.70	9.40	51.10	56.00	-4.90	QP	
8 *	1.6220	32.29	9.40	41.69	46.00	-4.31	AVG	
9	4.2019	42.05	9.55	51.60	56.00	-4.40	QP	
10	4.2019	29.84	9.55	39.39	46.00	-6.61	AVG	
11	9.2620	43.10	9.60	52.70	60.00	-7.30	QP	
12	9.2620	35.96	9.60	45.56	50.00	-4.44	AVG	

Note:

Freq. = Emission frequency in MHz

Reading level $(dB\mu V)$ = Receiver reading

Corr. Factor (dB) = LISN factor + Cable loss

Measurement $(dB\mu V)$ = Reading level $(dB\mu V)$ + Corr. Factor (dB)

 $Limit (dB\mu V) = Limit stated in standard$

 $Margin (dB) = Measurement (dB\mu V) - Limits (dB\mu V)$

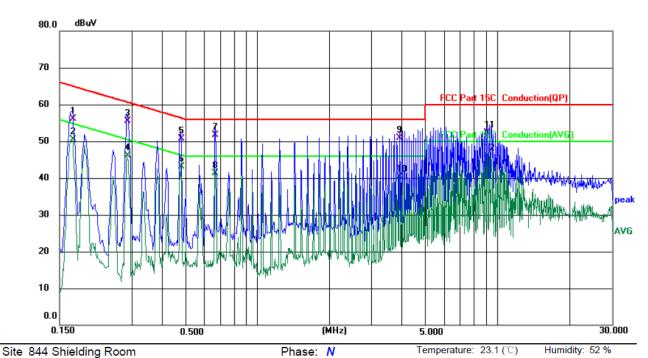
Q.P. =Quasi-Peak

AVG =average

^{*} is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz



Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



Limit: FCC Part 15C Conduction(QP) Power: AC 120 V/60 Hz

No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1700	46.51	9.59	56.10	64.96	-8.86	QP	
2	0.1700	40.84	9.59	50.43	54.96	-4.53	AVG	
3	0.2859	46.27	9.33	55.60	60.64	-5.04	QP	
4	0.2859	36.77	9.33	46.10	50.64	-4.54	AVG	
5	0.4779	41.59	9.21	50.80	56.38	-5.58	QP	
6 *	0.4779	33.94	9.21	43.15	46.38	-3.23	AVG	
7	0.6700	42.52	9.18	51.70	56.00	-4.30	QP	
8	0.6700	32.10	9.18	41.28	46.00	-4.72	AVG	
9	3.9140	41.35	9.55	50.90	56.00	-5.10	QP	
10	3.9140	30.83	9.55	40.38	46.00	-5.62	AVG	
11	9.0700	42.81	9.59	52.40	60.00	-7.60	QP	
12	9.0700	36.53	9.59	46.12	50.00	-3.88	AVG	

Note:

Freq. = Emission frequency in MHz

Reading level $(dB\mu V)$ = Receiver reading

Corr. Factor (dB) = LISN factor + Cable loss

Measurement $(dB\mu V)$ = Reading level $(dB\mu V)$ + Corr. Factor (dB)

 $Limit (dB\mu V) = Limit stated in standard$

 $Margin (dB) = Measurement (dB\mu V) - Limits (dB\mu V)$

Q.P. =Quasi-Peak AVG =average

^{*} is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

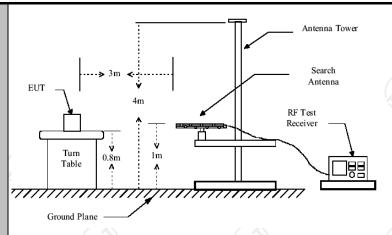


5.3. Radiated Spurious Emission Measurement

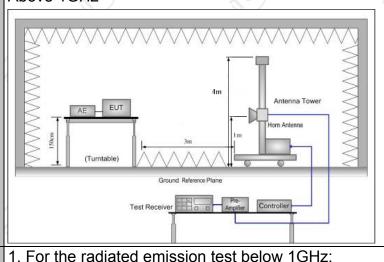
5.3.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.209								
Test Method:	ANSI C63.10								
Frequency Range:	9 kHz to 25 (T ()			K \			
. , ,	(U)	JI 12	<u>G)</u>		<u> (,c</u>				
Measurement Distance:	3 m								
Antenna Polarization:	Horizontal &	Vertical							
Operation mode:	Refer to item	3.1		(C)		ζĆ			
	Frequency	Detector	RBW	VBW		Remark			
	9kHz- 150kHz	Quasi-peak	200Hz	1kHz	Qua	si-peak Value			
Receiver Setup:	150kHz- 30MHz	Quasi-peak	9kHz	30kHz	Qua	si-peak Value			
·	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Qua	si-peak Value			
	Above 4CH-	Peak	1MHz	3MHz	Р	eak Value			
	Above 1GHz	Peak	1MHz	10Hz	Ave	erage Value			
	Frequen	су	Field Stre	\ \ - /	Measurement Distance (meters)				
	0.009-0.490		2400/F(KHz)		300				
	0.490-1.705		24000/F(KHz)		30				
	1.705-30		30		30				
	30-88		100		3				
I imait.	88-216		150		3				
Limit:	216-96 Above 9		200 500			3			
	715046 3			(0)					
	Frequency		Field Strength (microvolts/meter)		ment ice rs)	Detector			
	Above 1GHz	,	500		<u>(,c</u>	Average			
	Above 10112		5000			Peak			
Test setup:	For radiated emissions below 30MHz Distance = 3m Computer Pre -Amplifier								
	30MHz to 10	Ground GHZ	Plane		Receiver	J (c			





Above 1GHz



Test Procedure:

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

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Test mode:	Refer to section 3.1 for details
	 4. Use the following spectrum analyzer settings: (1) Span shall wide enough to fully capture the emission being measured; (2) Set RBW=120 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.
	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.



5.3.2. Test Instruments

Radiated Emission Test Site (966)									
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due					
EMI Test Receiver	R&S	ESIB7	100197	Jul. 07, 2022					
Spectrum Analyzer	R&S	FSQ40	200061	Jul. 07, 2022					
Pre-amplifier	SKET	LNPA_0118G- 45	SK2021012 102	Mar. 11, 2022					
Pre-amplifier	SKET	LNPA_1840G- 50	SK2021092 03500	Apr. 08, 2022					
Pre-amplifier	HP	8447D	2727A05017	Jul. 07, 2022					
Loop antenna	ZHINAN	ZN30900A	12024	Sep. 05, 2022					
Broadband Antenna	Schwarzbeck	VULB9163	340	Sep. 04, 2022					
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Sep. 04, 2022					
Horn Antenna	Schwarzbeck	BBHA 9170	00956	Apr. 10, 2023					
Antenna Mast	Keleto	RE-AM	N/A	N/A					
Coaxial cable	SKET	RC_DC18G-N	N/A	Apr. 08, 2022					
Coaxial cable	SKET	RC-DC18G-N	N/A	Apr. 08, 2022					
Coaxial cable	SKET	RC-DC40G-N	N/A	Jul. 07, 2022					
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A					

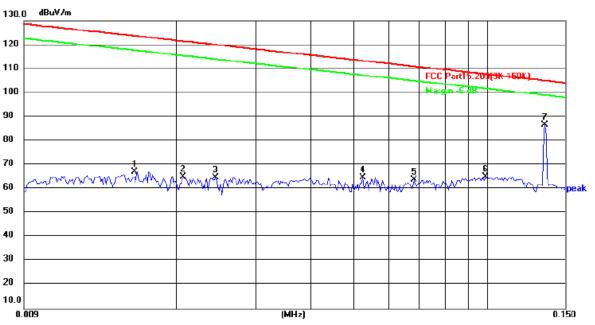


5.3.3. Test Data

Please refer to following diagram for individual

9KHz-30MHz





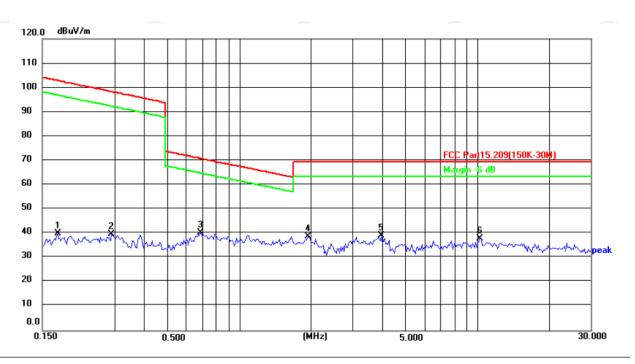
Site Polarization: Temperature: $25(^{\circ}\text{C})$ Limit: FCC Part15.209(9K-150K) Power: Humidity: 55%

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	0.0160	46.62	20.57	67.19	123.52	-56.33	peak
2	0.0206	46.70	18.45	65.15	121.33	-56.18	peak
3	0.0244	46.07	18.70	64.77	119.86	-55.09	peak
4	0.0524	44.06	20.57	64.63	113.23	-48.60	peak
5	0.0680	42.19	21.63	63.82	110.97	-47.15	peak
6	0.0989	41.40	23.74	65.14	107.71	-42.57	peak
7 *	0.1348	61.13	25.49	86.62	105.03	-18.41	peak

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150KHz-30MHz:



 Site
 Polarization:
 Temperature:
 25(°C)

 Limit: FCC Part15.209(150K-30M)
 Power:
 Humidity:
 55 %

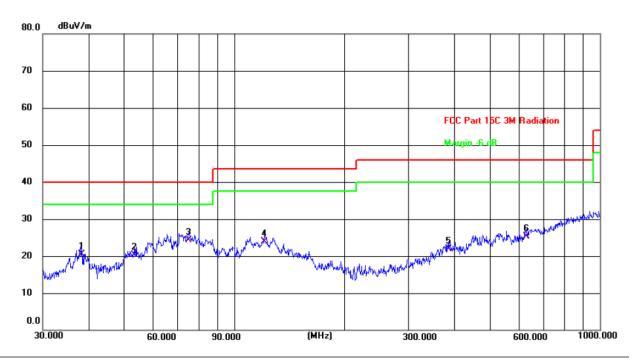
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	0.1737	13.65	26.37	40.02	102.82	-62.80	peak
2	0.2923	13.66	26.22	39.88	98.30	-58.42	peak
3	0.6895	15.32	25.16	40.48	70.84	-30.36	peak
4	1.9489	14.02	24.77	38.79	69.50	-30.71	peak
5 *	3.9639	14.50	24.66	39.16	69.50	-30.34	peak
6	10.2873	11.75	26.23	37.98	69.50	-31.52	peak





30MHz-1GHz

Horizontal:



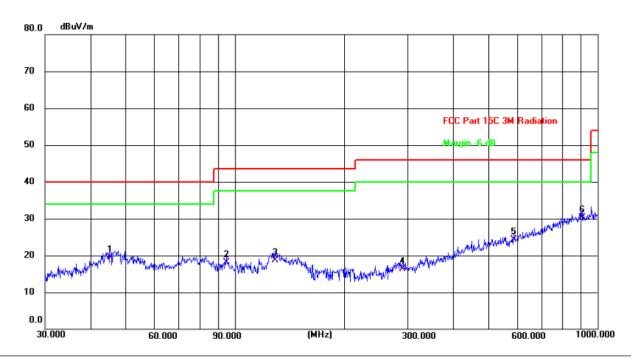
Site Polarization: Horizontal Temperature: 24.3(C)
Limit: FCC Part 15C 3M Radiation Power: AC 120 V/60 Hz Humidity: 51 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	38.3462	6.80	13.74	20.54	40.00	-19.46	QP	Р	
2	53.5052	6.70	13.54	20.24	40.00	-19.76	QP	Р	
3 *	75.1821	14.08	10.18	24.26	40.00	-15.74	QP	Р	
4	121.1230	11.87	12.03	23.90	43.50	-19.60	QP	Р	
5	385.2803	5.08	16.74	21.82	46.00	-24.18	QP	Р	
6	631.6883	3.52	21.76	25.28	46.00	-20.72	QP	Р	





Vertical:



Site Polarization: Vertical Temperature: 24.3(C)
Limit: FCC Part 15C 3M Radiation Power: AC 120 V/60 Hz Humidity: 51 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector	P/F	Remark
1	45.3753	5.56	13.88	19.44	40.00	-20.56	QP	Р	
2	94.7600	8.24	9.78	18.02	43.50	-25.48	QP	Р	
3	129.4677	6.18	12.57	18.75	43.50	-24.75	QP	Р	
4	290.0172	2.34	13.96	16.30	46.00	-29.70	QP	Р	
5	588.9048	3.25	21.05	24.30	46.00	-21.70	QP	Р	
6 *	906.4823	3.80	26.55	30.35	46.00	-15.65	QP	Р	

Note:

Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss - Pre-amplifier





Appendix A: Photographs of Test Setup Product: PORTABLE POWER STATION

Model: PS200 **Radiated Emission**







Conducted Emission



























































Appendix B: Photographs of EUT Product: PORTABLE POWER STATION

Model: PS200 External Photos























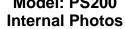








Product: PORTABLE POWER STATION Model: PS200







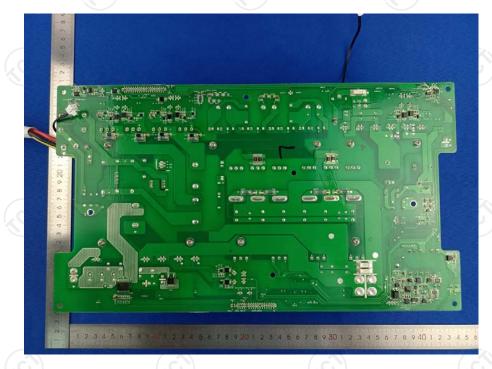












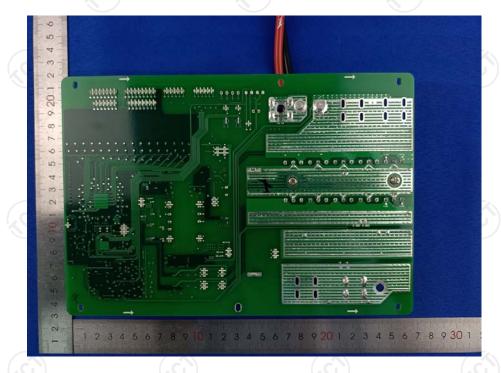












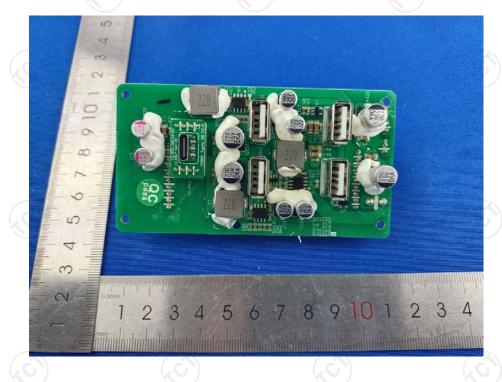




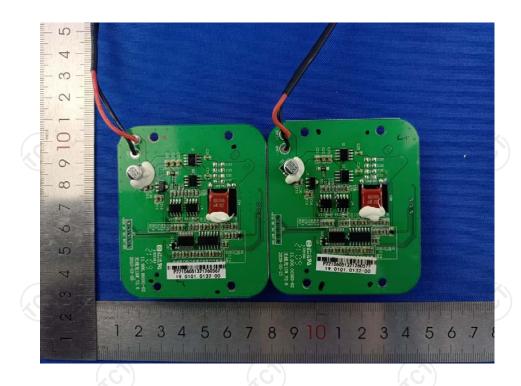


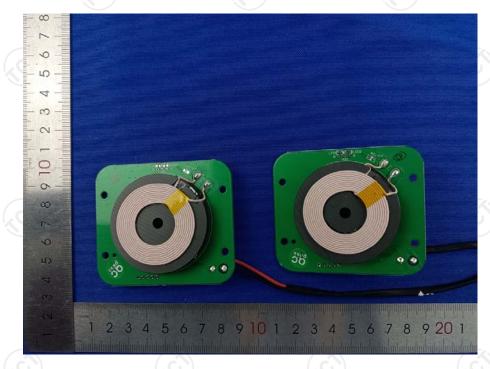












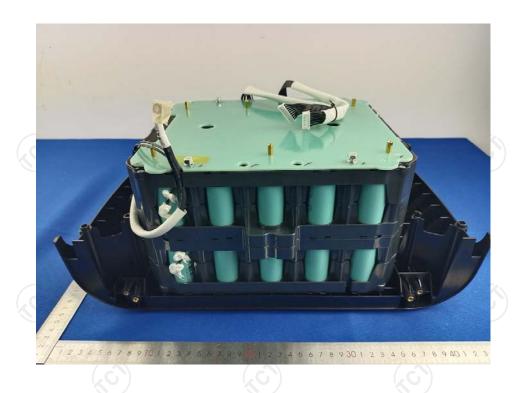












*****END OF REPORT****

