

FCC Test Report

Report No.: AGC01741231101FR04

FCC ID : 2AYT3-AC200PL

APPLICATION PURPOSE Original Equipment

PRODUCT DESIGNATION: Portable Power Station

BRAND NAME : BLUETTI

MODEL NAME : AC200P L

APPLICANT: SHENZHEN POWEROAK NEWENER CO., LTD

DATE OF ISSUE : Mar. 04, 2024

STANDARD(S) : FCC Part 15 Subpart C

REPORT VERSION: V 1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd



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REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Mar. 04 2024	Valid	Initial Release



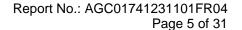
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1. GENERAL INFORMATION

Applicant	SHENZHEN POWEROAK NEWENER CO., LTD		
Address	F19, BLD No.1, Kaidaer Tongsha Rd No.168, Xili Street, Nanshan, Shenzhen, China		
Manufacturer	SHENZHEN POWEROAK NEWENER CO., LTD		
Address	F19, BLD No.1, Kaidaer Tongsha Rd No.168, Xili Street, Nanshan, Shenzhen, China		
Factory	Huizhou PowerOak Innovation Co.,Ltd		
Address	(No.1 Workshop)Longsheng 5th Road, Laoshe Village, Dayawan West Zone, Huizhou, Guangdong, China		
Product Designation	Portable Power Station		
Brand Name	BLUETTI		
Test Model	AC200P L		
Series Model(s)	N/A		
Difference Description	N/A		
Deviation from Standard	No any deviation from the test method		
Date of receipt of test item	Jan. 02, 2024		
Date of Test:	Jan. 02, 2024 – Mar. 01, 2024		
Test Result	Pass		
Test Report Form No	AGCTR-ER-FCC-WPTV1.0		

Prepared By	Alan Duan	
	Alan Duan (Project Engineer)	Mar. 04, 2024
Reviewed By	Calin Lin	
	Calvin Liu (Reviewer)	Mar. 04, 2024
Approved By	Max Zhang	
•	Max Zhang (Authorized Officer)	Mar. 04, 2024



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2. PRODUCT INFORMATION

2.1 PRODUCT TECHNICAL DESCRIPTION

Hardware Version	V6.0		
Software Version	2034		
Frequency Band	110.5kHz-205kHz		
Operation Frequency	113.4kHz, 118.7kHz		
Modulation Type	ASK		
Number of channels	2		
Field Strength of Fundamental	75.69dBuV/m (Max) at 3m distance		
Antenna Designation	Coil Antenna		
Antenna Gain	0dBi		
Input Rating	AC: 120V~50/60Hz, 20A Max. DC: 12V-30V-8A PV: 12V-145V-15A Max. Battery Expansion: 51.2V-60A Max.		
Output Rating	AC: 120V~50/60Hz, 2400W Max. Aviation Sockets: 48V=8A USB-A: 5V=3A, 9V=2A, 12V=1.5A, 18W Each USB-C: 5/9/12/15/20V=3A, 20V=5A Cigarette Lighter Port: 12V=10A Wireless Charging: 5/7.5/10/15W AC and DC Output: 2500W Total Battery Expansion: 51.2V=60A Max.		

2.2 TEST FREQUENCY LIST

Frequency Band	Channel Number	Frequency
110.5kHz-205kHz	01	113.4kHz
	02	118.7kHz



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2.3 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for FCC ID: 2AYT3-AC200PL, filing to comply with Part 2, Part 15 of the Federal Communication Commission rules.

2.4 TEST METHODOLOGY

The tests were performed according to following standards:

No.	Identity	Document Title
1	1 FCC 47 CFR Part 2 Frequency allocations and radio treaty matters; general rules and regu	
2	FCC 47 CFR Part 15	Radio Frequency Devices
3	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

2.5 SPECIAL ACCESSORIES

Not available for this EUT intended for grant.

2.6 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

2.7 ANTENNA REQUIREMENT

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.

EUT Antenna:

The non-detachable antenna inside the device cannot be replaced by the user at will. The gain of the antenna is 0dBi.



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3. TEST ENVIRONMENT

3.1 ADDRESS OF THE TEST LABORATORY

Laboratory: Attestation of Global Compliance (Shenzhen) Co., Ltd.

Address: 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

3.2 TEST FACILITY

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

CNAS-Lab Code: L5488

Attestation of Global Compliance (Shenzhen) Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No.: 5054.02

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 975832

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files with Registration 975832.

IC-Registration No.: 24842 (CAB identifier: CN0063)

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Certification and Engineering Bureau of Industry Canada. The acceptance letter from the IC is maintained in our files with Registration 24842.



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3.3 ENVIRONMENTAL CONDITIONS

	NORMAL CONDITIONS	EXTREME CONDITIONS		
Temperature range (°C)	15 - 35	-20 - 50		
Relative humidty range	20 % - 75 %	20 % - 75 %		
Pressure range (kPa)	86 - 106	86 - 106		
Power supply				

Note: The Extreme Temperature and Extreme Voltages declared by the manufacturer.

3.4 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement y ±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%.

Item	Measurement Uncertainty
Uncertainty of Conducted Emission for AC Port	$U_c = \pm 2.9 \text{ dB}$
Uncertainty of Radiated Emission below 150kHz	$U_c = \pm 4.2 \text{ dB}$
Uncertainty of Radiated Emission below 30MHz	$U_c = \pm 3.8 \text{ dB}$
Uncertainty of Radiated Emission below 1GHz	$U_c = \pm 3.9 \text{ dB}$
Uncertainty of total RF power, conducted	$U_c = \pm 0.8 \text{ dB}$
Uncertainty of RF power density, conducted	$U_c = \pm 2.6 \text{ dB}$
Uncertainty of spurious emissions, conducted	U _c = ±2 %
Uncertainty of Occupied Channel Bandwidth	$U_c = \pm 2 \%$



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3.5 LIST OF EQUIPMENTS USED

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	Jun. 03, 2023	Jun. 02, 2024
LISN	R&S	ESH2-Z5	100086	Jun. 03, 2023	Jun. 02, 2024
Test Software	R&S	Ver.V1.71	N/A	N/A	N/A
TEST RECEIVER	R&S	ESCI	10096	Feb. 18, 2023	Feb. 17, 2024
TEST RECEIVER	R&S	ESCI	10096	Feb. 01, 2024	Jan. 31, 2025
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Jun. 01, 2023	May 31, 2024
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	Mar. 12, 2022	Mar. 11, 2024
ANTENNA	SCHWARZBECK	VULB9168	494	Jan. 05, 2023	Jan. 04, 2025
Test Software	FARA	Ver.RA-03A	N/A	N/A	N/A



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4.SYSTEM TEST CONFIGURATION

4.1 EUT CONFIGURATION

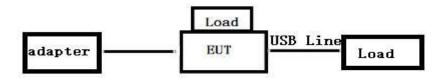
The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

4.2 EUT EXERCISE

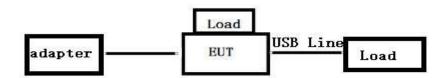
The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

4.3 CONFIGURATION OF TESTED SYSTEM

Radiated Emission Configure:



Conducted Emission Configure:



4.4 EQUIPMENT USED IN TESTED SYSTEM

The Following Peripheral Devices And Interface Cables Were Connected During The Measurement:

☐ Test Accessories Come From The Laboratory

Item	Item Equipment Model		Identifier	Note
1	wireless charging load	Huawei	-	Accessories

☐ Test Accessories Come From The Manufacturer

It	tem	Equipment	Model No.	o. Identifier		
	1	Portable Power Station	AC200P L	2AYT3-AC200PL	EUT	



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4.5 SUMMARY OF TEST RESULTS

Item	FCC Rules	es Description Of Test	
1	§15.203	Antenna Equipment	Pass
2	§15.209(a)(f)	Radiated Spurious Emission	Pass
3	§15.215(c)	20dB Bandwidth	Pass
4	§15.205(a)	Restricted Bands of Operation	Pass
5	§15.207	AC Power Line Conducted Emission	Pass



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5. DESCRIPTION OF TEST MODES

Summary table of Test Cases				
Test Item	Equipment type / Modulation			
rest item	WPT_ASK			
Radiated & Conducted Test Cases	Mode 1: Battery powered or AC input + EUT + Wireless load (Full Load) Mode 2: Battery powered or AC input + EUT + Wireless load (Half Load) Mode 3: Battery powered or AC input + EUT + Wireless load (Null Load) Mode 4: Battery powered or AC input + EUT (Null Load)			
AC Conducted Emission	Mode 1: AC input + EUT + Wireless load (Full Load) Mode 2: AC input + EUT + Wireless load (Half Load) Mode 3: AC input + EUT + Wireless load (Null Load) Mode 4: AC input + EUT (Null Load)			

Note:

- 1. Only the result of the worst case was recorded in the report, if no other cases.
- 2. The battery is full-charged during the test.



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6. FIELD STRENGTH OF FUNDAMENTAL

6.1 PROVISIONS APPLICABLE

Test Requirement:	FCC Part15 C Section 15.209					
Test Method:	ANSI C63.10:2013					
Test Frequency Range:	9kHz to 1GHz					
Test site:	Measurement Distance: 3m					
	Frequency	Detector	RBW	VBW	Value	
	9kHz-150kHz	Quasi-peak	200Hz	600Hz	Quasi-peak	
Receiver setup:	150kHz-30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak	
ixeceivei setup.	30MHz-1GHz	Quasi-peak	100kHz	300kHz	Quasi-peak	
	Above 4CUz	Peak	1MHz	3MHz	Peak	
	Above 1GHz	Peak	1MHz	10Hz	Average	

Limits for frequency below 30MHz

Frequency	Limit (uV/m)	Measurement Distance(m)	Remark
0.009-0.490	2400/F(kHz)	300	Quasi-peak Value
0.490-1.705	24000/F(kHz)	30	Quasi-peak Value
1.705-30	30	30	Quasi-peak Value

Limits for frequency Above 30MHz

Frequency	Limit (dBuV/m @3m)	Remark	
30MHz-88MHz	40.00	Quasi-peak Value	
88MHz-216MHz	43.50	Quasi-peak Value	
216MHz-960MHz	46.00	Quasi-peak Value	
960MHz-1GHz	54.00	Quasi-peak Value	
Above 1GHz	54.00	Average Value	
Above IGHZ	74.00	Peak Value	

Remark:

- (1) Emission level dB μ V = 20 log Emission level μ V/m
- (2) The smaller limit shall apply at the cross point between two frequency bands.
- (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.



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6.2 MEASUREMENT PROCEDURE

- The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
- 2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- 3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
- 4. For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- 5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
- 6. For emissions above 1GHz, use 1MHz RBW and 3MHz VBW for peak reading. Place the measurement antenna 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.
- 7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
- 8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
- 9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- 10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High Low scan is not required in this case.



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6.3 FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any), Average Factor (optional) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG - AV

where $FS = Field Strength in dB\mu V/m$

RA = Receiver Amplitude (including preamplifier) in dBµV

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB/m AG = Amplifier Gain in dB AV = Average Factor in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows:

FS = RR + LF where FS = Field Strength in $dB\mu V/m$ RR = RA - AG - AV in $dB\mu V$ LF = CF + AF in dB

Assume a receiver reading of 52.0 dB μ V is obtained. The antenna factor of 7.4 dB/m and cable factor of 1.6 dB are added. The amplifier gain of 29 dB and average factor of 5 dB are subtracted, giving a field strength of 27 dB μ V/m.

This value in dBµV/m was converted to its corresponding level in µV/m.

 $RA = 52.0 dB\mu V/m$

AF = 7.4 dB/m $RR = 18.0 \text{ dB}\mu\text{V}$ CF = 1.6 dB LF = 9.0 dB

 $AG = 29.0 \, dB$

AV = 5.0 dBFS = RR + LF

 $FS = 18 + 9 = 27 dB\mu V/m$

Level in μ V/m = Common Antilogarithm [(27 dB μ V/m)/20] = 22.4 μ V/m

Magnetic field strength calculation (9 kHz – 30 MHz)

When the limit is in terms of magnetic field, the following equation applies:

 $H[dB(\mu A/m)] = V[dB(\mu V)] + LC[dB] - GPA[dB] + AFH[dB(S/m)]$

Where,

H is the magnetic field strength (to be compared with the limit),

V is the voltage level measured by the receiver or spectrum analyzer,

LC is the cable loss,

GPA is the gain of the preamplifier (if used), and

AFH is the magnetic antenna factor.

If the "electrical" antenna factor is used instead, the above equation becomes:

 $H[dB(\mu A/m)] = V[dB(\mu V)] + LC[dB] - GPA[dB] + AFE[dB(m-1)] - 51.5[dB\Omega]$

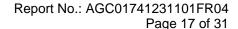
where AFE is the "electric" antenna factor, as provided by the antenna calibration laboratory.

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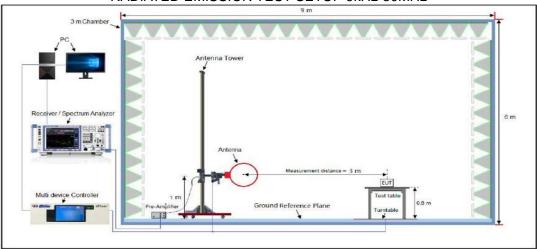
Tel: +86-755 2523 4088 E-mail: agc@agccert.com Web: http://www.agccert.com/



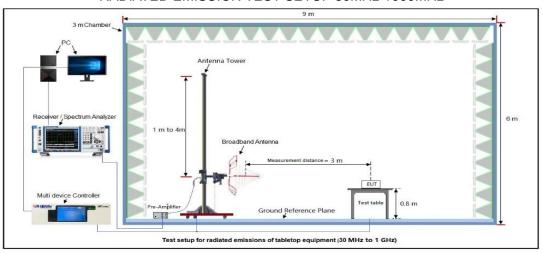


6.4 MEASUREMENT SETUP (BLOCK DIAGRAM OF CONFIGURATION)

RADIATED EMISSION TEST SETUP 9kHz-30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



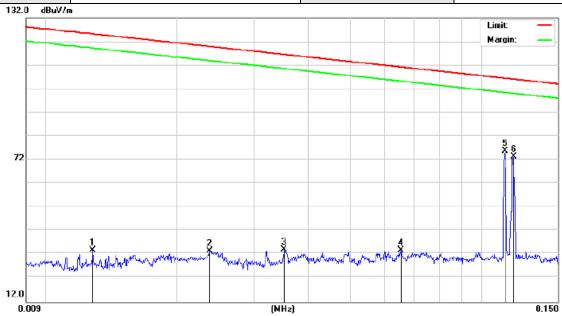
The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209 and FCC 15.205 limits.



6.5 MEASUREMENT RESULTS

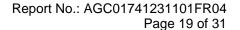
ELECTRIC FIELD TEST IN THE FREQUENCY RANGE 9kHz-150kHz

EUT	Portable Power Station	Model Name	AC200P L				
Temperature	22° C	Relative Humidity	55%				
Pressure	960hPa	Test Voltage	AC120V, 50Hz				
Test Mode	Mode 1	Antenna	Face				



No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	0.0128	-3.60	37.29	33.69	125.2	-91.58	peak
2	0.0238	-1.47	34.92	33.45	119.9	-86.46	peak
3	0.0352	1.38	32.62	34.00	116.5	-82.53	peak
4	0.0652	4.90	28.73	33.63	111.2	-77.58	peak
5 *	0.1134	47.87	27.82	75.69	106.4	-30.74	peak
6	0.1187	45.54	27.75	73.29	106.4	-32.75	peak

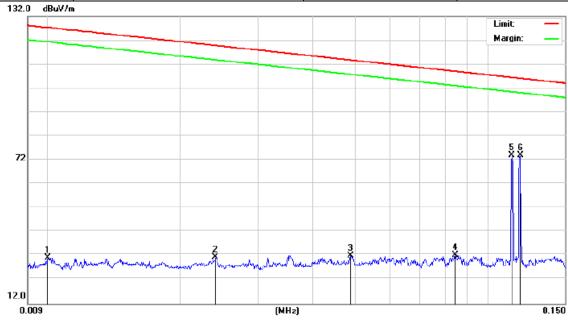
RESULT: PASS





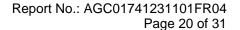
ELECTRIC FIELD TEST IN THE FREQUENCY RANGE 9kHz-150kHz

EUT	Portable Power Station	Model Name	AC200P L			
Temperature	22° C	Relative Humidity	55%			
Pressure	960hPa	Test Voltage	AC120V, 50Hz			
Test Mode	Side					
132.0 dBuV/m						



No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	0.0100	-6.86	37.90	31.04	127.4	-96.36	peak
2	0.0240	-3.48	34.87	31.39	119.8	-88.45	peak
3	0.0488	1.86	30.12	31.98	113.7	-81.73	peak
4	0.0842	4.48	27.68	32.16	109.0	-76.84	peak
5	0.1134	45.99	27.82	73.81	106.4	-32.62	peak
6 *	0.1187	46.17	27.75	73.92	106.4	-32.12	peak

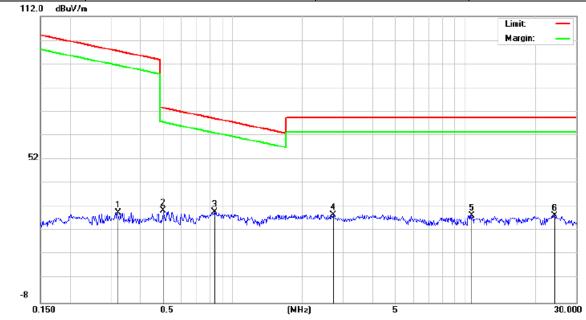
RESULT: PASS





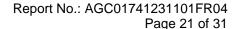
ELECTRIC FIELD TEST IN THE FREQUENCY RANGE 150kHz-30MHz

EUT	Portable Power Station	Model Name	AC200P L
Temperature	22° C	Relative Humidity	55%
Pressure	960hPa	Test Voltage	AC120V, 50Hz
Test Mode	Mode 1	Antenna	Face



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		0.3217	4.42	25.31	29.73	97.44	-67.71	peak
2		0.5047	5.27	25.40	30.67	73.54	-42.87	peak
3	*	0.8349	4.69	25.28	29.97	69.17	-39.20	peak
4		2.7068	4.28	24.38	28.66	69.54	-40.88	peak
5		10.6198	5.32	23.25	28.57	69.54	-40.97	peak
6		24.1423	4.06	24.34	28.40	69.54	-41.14	peak

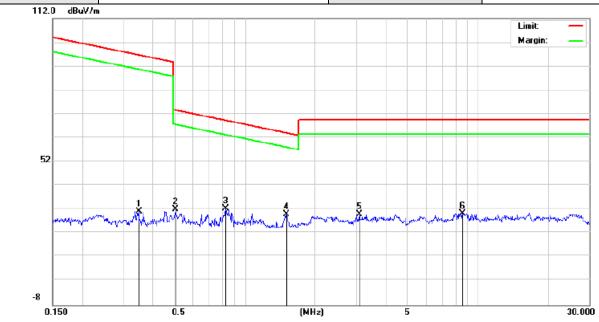
RESULT: PASS





ELECTRIC FIELD TEST IN THE FREQUENCY RANGE 150kHz-30MHz

EUT	Portable Power Station	Model Name	AC200P L
Temperature	22° C	Relative Humidity	55%
Pressure	960hPa	Test Voltage	AC120V, 50Hz
Test Mode	Mode 1	Antenna	Side

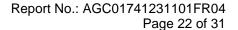


No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	0.3502	5.77	25.33	31.10	96.71	-65.61	peak
2	0.5047	6.69	25.40	32.09	73.54	-41.45	peak
3	0.8261	7.10	25.29	32.39	69.26	-36.87	peak
4 *	1.5033	4.82	25.00	29.82	64.06	-34.24	peak
5	3.0901	5.73	24.15	29.88	69.54	-39.66	peak
6	8.5463	6.79	23.43	30.22	69.54	-39.32	peak

RESULT: PASS

NOTES:

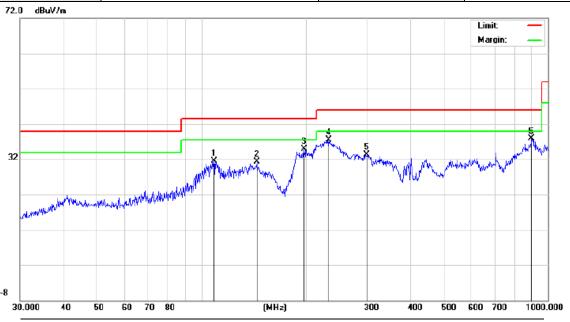
- 1. Peak detector is used for frequency below 30MHz.
- 2. Negative value in the margin column shows emission below limit.
- 3. All measurements were made with 0.6m loop antenna at 3m distance. All emissions are below the QP limit.
- 4. Corr. Factor= Antenna Factor (dB/m) + Cable Loss (dB)
- 5. Loop antenna is used for the emission under 30MHz.





RADIATED EMISSION BELOW 1GHz

EUT	Portable Power Station	Model Name	AC200P L			
Temperature	22° C	Relative Humidity	55%			
Pressure	960hPa	Test Voltage	AC120V, 50Hz			
Test Mode	Mode 1	Antenna	Horizontal			



No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		108.6470	15.28	16.29	31.57	43.50	-11.93	peak
2		144.3348	16.68	14.57	31.25	43.50	-12.25	peak
3		197.8928	20.73	14.26	34.99	43.50	-8.51	peak
4		232.5318	22.47	15.03	37.50	46.00	-8.50	peak
5		300.3672	16.83	16.50	33.33	46.00	-12.67	peak
6	*	896.9965	6.49	31.42	37.91	46.00	-8.09	peak

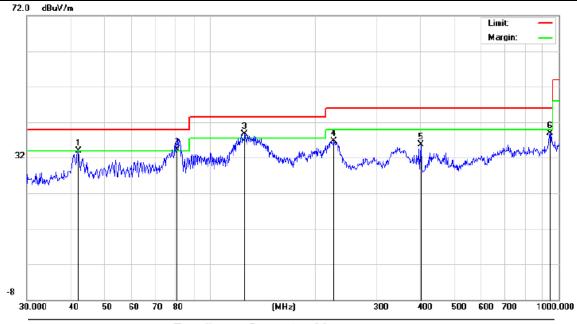
RESULT: PASS





RADIATED EMISSION BELOW 1GHz

EUT	Portable Power Station	Model Name	AC200P L
Temperature	22° C	Relative Humidity	55%
Pressure	960hPa	Test Voltage	AC120V, 50Hz
Test Mode	Mode 1	Antenna	Vertical



No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		42.0065	16.92	16.92	33.84	40.00	-6.16	peak
2	ļ	80.6441	17.56	16.81	34.37	40.00	-5.63	QP
3	*	125.8863	20.82	17.85	38.67	43.50	-4.83	peak
4		226.8935	20.35	16.34	36.69	46.00	-9.31	peak
5		401.8385	13.38	22.26	35.64	46.00	-10.36	peak
6		942.1304	7.93	30.91	38.84	46.00	-7.16	peak

RESULT: PASS

Note: 1. Factor=Antenna Factor + Cable loss, Over=Measurement-Limit.

- 2. All testing modes have undergone pre testing. Mode 1 AC input operation is the worst-case scenario and documented in the report.
- 3. The "Factor" value can be calculated automatically by software of measurement system.



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7. 20 dB BANDWIDTH

7.1 PROVISIONS APPLICABLE

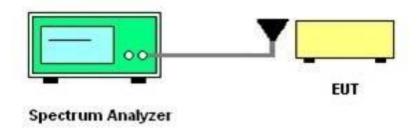
N/A

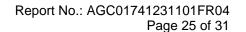
7.2 MEASUREMENT PROCEDURE

Set the parameters of SPA as below:

- 1. The spectrum analyzer connected via a receive antenna placed near the EUT in peak Max hold mode.
- 2. Centre frequency = Operation Frequency
- 3. The resolution bandwidth of 300 Hz and the video bandwidth of 1 kHz were used.
- 4. Span: 3kHz, Sweep time: Auto
- 5. Set the EUT to continue transmitting mode. Allow the trace to stabilize. Use the "N dB down" function of SPA to define the bandwidth.
- 6. Measured the spectrum width with power higher than 20dB below carrier.
- 7. Measured the 99% OBW.
- 8. Record the plots and Reported.

7.3 MEASUREMENT SETUP (BLOCK DIAGRAM OF CONFIGURATION)



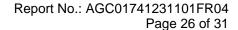




7.4 MEASUREMENT RESULTS

	Test Data of Occupied Bandwidth and -20dB Bandwidth								
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (kHz)	-20dB Bandwidth (kHz)	Limits (MHz)	Pass or Fail				
ASK	0.1134	0.692	0.812	N/A	Pass				
ASK	0.1187	0.827	0.969	N/A	Pass				

Test Graphs of Occupied Bandwidth Center Freq 113.400 kHz
Trig: Free Run
#IFGain:Low
#Atten: 10 dB Frequency Center Freq 113.400 kHz Avg|Hold:>10/10 Radio Device: BTS Ref 20.00 dBm Center Freq 113.400 kHz Center 113.4 kHz #Res BW 300 Hz Span 3 kHz Sweep 40.87 ms CF Step 300 Hz #VBW 1 kHz Man **Total Power** 1.84 dBm Occupied Bandwidth 692 Hz Freq Offset 31 Hz **Transmit Freq Error OBW Power** 99.00 % x dB Bandwidth 812 Hz x dB -20.00 dB STATUS









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8. AC POWER LINE CONDUCTED EMISSION TEST

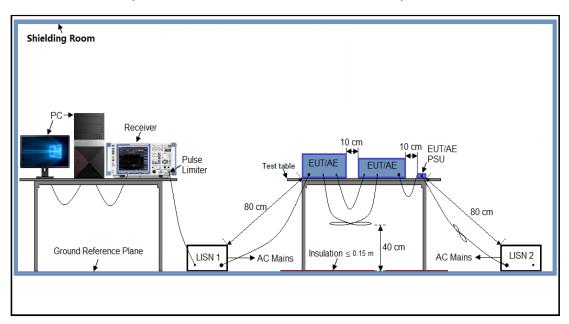
8.1 LIMITS OF LINE CONDUCTED EMISSION TEST

Francis	Maximum RF Line Voltage				
Frequency	Q.P. (dBμV)	Average (dBμV)			
150kHz~500kHz	66-56	56-46			
500kHz~5MHz	56	46			
5MHz~30MHz	60	50			

Note:

- 1. The lower limit shall apply at the transition frequency.
- 2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

8.2 MEASUREMENT SETUP (BLOCK DIAGRAM OF CONFIGURATION)





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8.3 PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

- 1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2. Support equipment, if needed, was placed as per ANSI C63.10.
- 3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
- 4. All support equipment received AC120V/60Hz power from a LISN, if any.
- 5. The EUT received DC 24V power from adapter which received AC120V/60Hz power from a LISN.
- 6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
- 8. During the above scans, the emissions were maximized by cable manipulation.
- 9. The test mode(s) were scanned during the preliminary test.

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

8.4 FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

- EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
- 2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
- 3. The test data of the worst case condition(s) was reported on the Summary Data page.



8.5 MEASUREMENT RESULTS

/lode	Mode 1			LI	SN line	Н	lot Side
Level	[dBµ∨]						
80				-,		,	
70							
60			_i	_ii	i <u>i</u>	<u> </u>	<u> </u>
50							
40	Munny X		Indian's Manager	Polace			
30	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	man the same of	- Harrista A.	x X			A STATE OF THE PARTY OF THE PAR
			!	and the latest and th		Jane Charles March March 1988	Harris and the same of the sam
20		-+	!	-	***		
10					;;;	/	
0							
-10 150)k 300k 400k	600k 800k	1M	2M 3M	4M 5M 6M	8M 10M	20M 30M
			Freq	uency [Hz]			
x x x ME	S agc_fin						
ME	ASUREMENT 24/1/12 11:	12	_				
ME	ASUREMENT	12	: "agc_ Transd dB		Margin dB	Detect	or Line
ME	ASUREMENT 24/1/12 11: Frequency	12 Level	Transd	Limit		Detect	or Line Ll
ME	ASUREMENT 24/1/12 11: Frequency MHz	12 Level dBµV	Transd dB	Limit dBµV	dB		
ME	24/1/12 11: Frequency MHz 0.326000 0.786000 1.254000	12 Level dBµV 42.70 41.40 42.40	Transd dB 6.1 6.2 6.2	Limit dBµV	dB 16.9	QP	L1
ME	24/1/12 11: Frequency MHz 0.326000 0.786000 1.254000	12 Level dBµV 42.70 41.40	Transd dB 6.1 6.2	Limit dBµV 60 56	dB 16.9 14.6	QP QP	L1 L1
ME	ASUREMENT 24/1/12 11: Frequency MHz 0.326000 0.786000 1.254000 1.598000 2.178000	12 Level dBµV 42.70 41.40 42.40 39.90 35.40	Transd dB 6.1 6.2 6.2 6.2 6.3	Limit dBµV 60 56 56	dB 16.9 14.6 13.6 16.1 20.6	QP QP QP	L1 L1 L1
ME	24/1/12 11: Frequency MHz 0.326000 0.786000 1.254000 1.598000	12 Level dBµV 42.70 41.40 42.40 39.90 35.40	Transd dB 6.1 6.2 6.2 6.2	Limit dBµV 60 56 56 56	dB 16.9 14.6 13.6 16.1	QP QP QP QP	L1 L1 L1 L1
ME	ASUREMENT 24/1/12 11: Frequency MHz 0.326000 0.786000 1.254000 1.598000 2.178000	12 Level dBµV 42.70 41.40 42.40 39.90 35.40	Transd dB 6.1 6.2 6.2 6.2 6.3	Limit dBµV 60 56 56 56	dB 16.9 14.6 13.6 16.1 20.6	QP QP QP QP QP	L1 L1 L1 L1 L1

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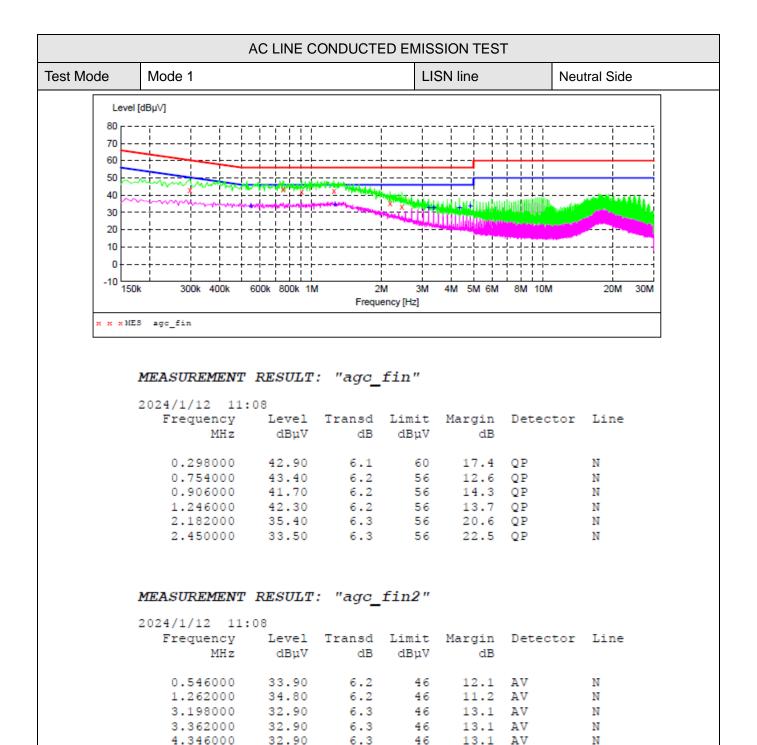
Line
L1 L1 L1
L1 L1 L1

RESULT: PASS

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RESULT: PASS

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APPENDIX I: PHOTOGRAPHS OF TEST SETUP

Refer to the Report No.: AGC01741231101AP02

APPENDIX II: PHOTOGRAPHS OF TEST EUT

Refer to the Report No.: AGC01741231101AP03

----END OF REPORT-----



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