FCC REPORT

Applicant:	Baicells Technologies Co., Ltd.
Address of Applicant:	3F, Hui Yuan Development Building, No.1 Shangdi Information Industry Base, Haidian Dist., Beijing, China

Equipment Under Test (EUT)

Product Name:	Outdoor Smart UPS
Model No.:	EPB41211
FCC ID:	2AG32EPB41211
Applicable standards:	FCC CFR Title 47 Part 15 Subpart B
Date of sample receipt:	27 Mar., 2019
Date of Test:	27 Mar., to 12 Apr., 2019
Date of report issued:	15 Apr., 2019
Test Result:	Pass *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Bruce Zhang
Laboratory Manager

2 Version

Version No.	Date	Description
00	*15 Apr., 2019*	*Original*

Tested by:  ***Date:*** *15 Apr., 2019*

Test Engineer

Reviewed by:  ***Date:*** *15 Apr., 2019*

Project Engineer

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4 Test Summary

Test Item	Section in CFR 47	Result
Conducted Emission	Part 15.107	Pass
Radiated Emission	Part 15.109	Pass
Remark: *Pass: The EUT complies with the essential requirements in the standard.* *N/A: The EUT not applicable of the test item.*		

5 General Information

5.1 Client Information

Applicant:	Baicells Technologies Co., Ltd.
Address:	3F, Hui Yuan Development Building, No.1 Shangdi Information Industry Base, Haidian Dist., Beijing, China
Manufacturer:	Baicells Technologies Co., Ltd.
Address:	3F, Hui Yuan Development Building, No.1 Shangdi Information Industry Base, Haidian Dist., Beijing, China

5.2 General Description of E.U.T.

Product Name:	Outdoor Smart UPS
Model No.:	EPB41211
Power supply:	Model No.: 12S2P-B Battery Pack Nominal Voltage: 43.2V Nominal Capacity: 5000mAh Nominal Energy: 216Wh Output Voltage Range: DC37V~DC54V Peak Output Power:≤200W
Test Sample Condition:	The test samples were provided in good working order with no visible defects.

5.3 Test Mode

Operating mode	Detail description
Full load mode	Keep the EUT in Full load mode
The sample was placed 0.8m 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 are shown in Test Results of the following pages.	

5.4 Measurement Uncertainty

Parameters	Expanded Uncertainty
Conducted Emission (9kHz ~ 30MHz)	±2.22 dB (k=2)
Radiated Emission (9kHz ~ 30MHz)	±2.76 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	±4.28 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	±5.72 dB (k=2)
Radiated Emission (18GHz ~ 40GHz)	±2.88 dB (k=2)

5.5 Description of Support Units

Manufacturer	Description	Model	Serial Number	FCC ID/DoC
/	Cement Resistor	30W 5RJ/30RJ	/	/

5.6 Related Submittal(s) / Grant (s)

This is an original grant, no related submittals and grants.

5.7 Description of Cable Used

N/A

5.8 Laboratory Facility

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

- **FCC - Registration No.: 727551**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been accredited as a testing laboratory by FCC (Federal Communications Commission). The Registration No. is 727551.

- **IC - Registration No.: 10106A-1**

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

- **CNAS - Registration No.: CNAS L6048**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

- **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: https://portal.a2la.org/scopepdf/4346-01.pdf

5.9 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd.
Address: No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road,
Bao'an District, Shenzhen, Guangdong, China
Tel: +86-755-23118282, Fax: +86-755-23116366
Email: info@ccis-cb.com, Website: http://www.ccis-cb.com

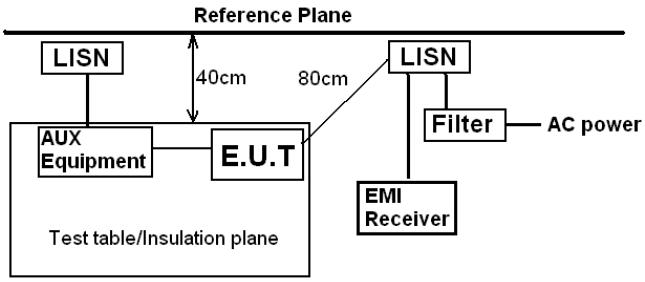
5.10 Test Instruments list

Radiated Emission:					
Test Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date (mm-dd-yy)**	**Cal. Due date (mm-dd-yy)**
3m SAC	SAEMC	9m*6m*6m	966	07-22-2017	07-21-2020
Loop Antenna	SCHWARZBECK	FMZB1519B	00044	03-18-2019	03-17-2020
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	03-18-2019	03-17-2020
Horn Antenna	SCHWARZBECK	BBHA9120D	916	03-18-2019	03-17-2020
Horn Antenna	SCHWARZBECK	BBHA9120D	1805	06-22-2017	06-21-2020
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170582	11-21-2018	11-20-2019
EMI Test Software	AUDIX	E3	Version: 6.110919b		
Pre-amplifier	HP	8447D	2944A09358	03-18-2019	03-17-2020
Pre-amplifier	CD	PAP-1G18	11804	03-18-2019	03-17-2020
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-18-2019	03-17-2020
Spectrum analyzer	Rohde & Schwarz	FSP40	100363	11-21-2018	11-20-2019
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-18-2019	03-17-2020
Cable	ZDECL	Z108-NJ-NJ-81	1608458	03-18-2019	03-17-2020
Cable	MICRO-COAX	MFR64639	K10742-5	03-18-2019	03-17-2020
Cable	SUHNER	SUCOFLEX100	58193/4PE	03-18-2019	03-17-2020

Conducted Emission:					
Test Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date (mm-dd-yy)**	**Cal. Due date (mm-dd-yy)**
EMI Test Receiver	Rohde & Schwarz	ESCI	101189	03-18-2019	03-17-2020
Pulse Limiter	SCHWARZBECK	OSRAM 2306	9731	03-18-2019	03-17-2020
LISN	CHASE	MN2050D	1447	03-18-2019	03-17-2020
LISN	Rohde & Schwarz	ESH3-Z5	8438621/010	07-21-2018	07-20-2019
Cable	HP	10503A	N/A	03-18-2019	03-17-2020
EMI Test Software	AUDIX	E3	Version: 6.110919b		

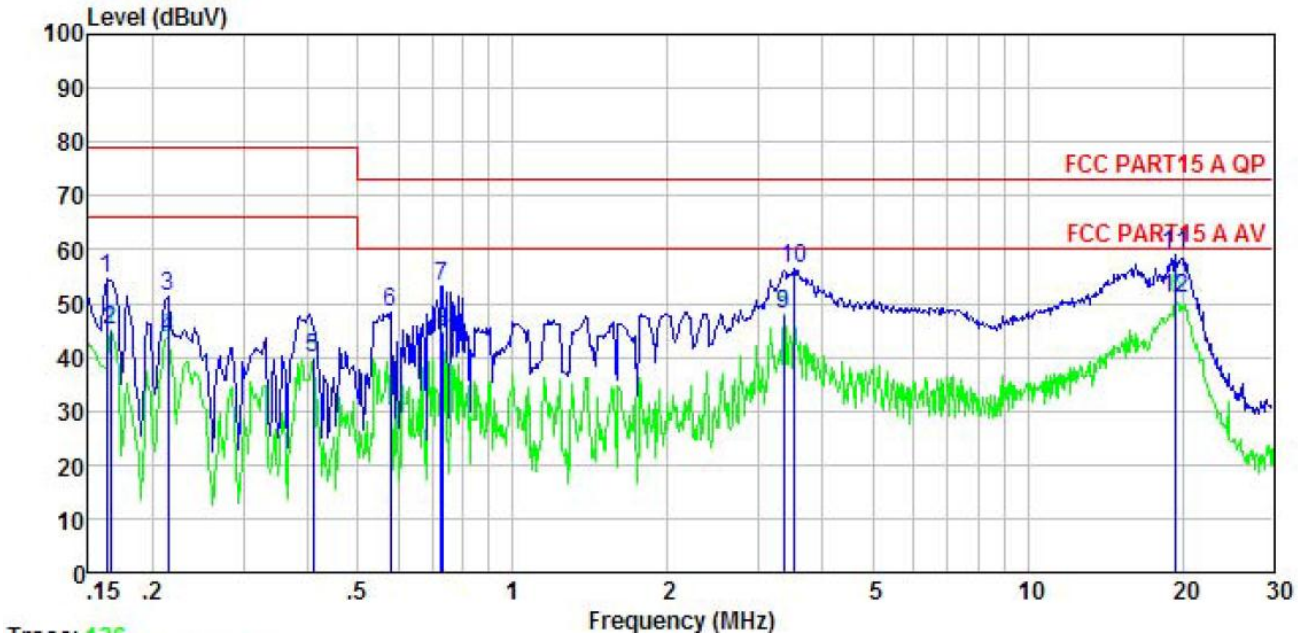
6 Test results and Measurement Data

6.1 Conducted Emission

Test Requirement:	FCC Part 15 B Section 15.107		
Test Method:	ANSI C63.4:2014		
Test Frequency Range:	150kHz to 30MHz		
Class / Severity:	Class A		
Receiver setup:	RBW=9kHz, VBW=30kHz		
Limit:	Frequency range (MHz)	Limit (dBµV)	
		Quasi-peak	Average
	0.15-0.5	79	66
	0.5-30	73	60
Test setup:	 *Remark:* *E.U.T: Equipment Under Test* *LISN: Line Impedence Stabilization Network* *Test table height=0.8m*		
Test procedure	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network(L.I.S.N.). The provide a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs). 3. 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 C63.4: 2014 on conducted measurement.		
Test Instruments:	Refer to section 5.9 for details		
Test mode:	Refer to section 5.3 for details		
Test results:	Pass		

Measurement data:

Product name:	Outdoor Smart UPS	**Product model:**	EPB41211
Test by:	Carey	**Test mode:**	Full load mode
Test frequency:	150 kHz ~ 30 MHz	**Phase:**	Line
Test voltage:	AC 120 V/60 Hz	**Environment:**	Temp: 22.5℃ Huni: 55%

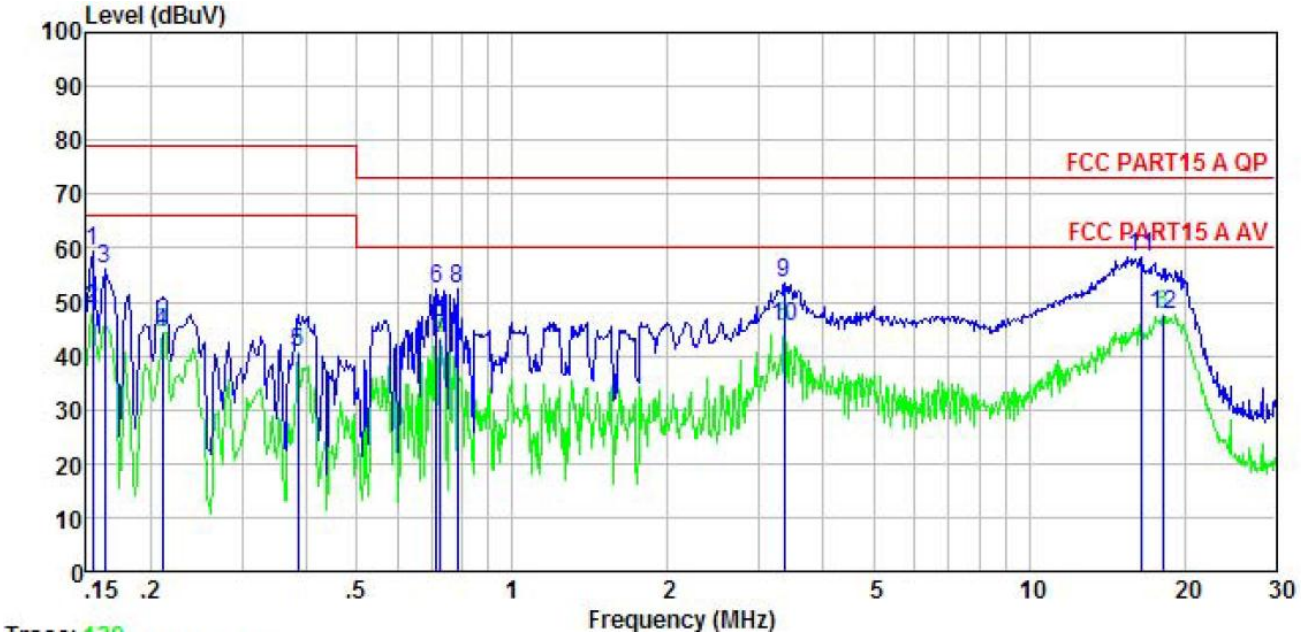


	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.162	44.13	-0.44	10.77	54.46	79.00	-24.54	QP
2	0.166	34.55	-0.44	10.77	44.88	66.00	-21.12	Average
3	0.214	40.97	-0.41	10.76	51.32	79.00	-27.68	QP
4	0.214	33.36	-0.41	10.76	43.71	66.00	-22.29	Average
5	0.410	29.47	-0.37	10.72	39.82	66.00	-26.18	Average
6	0.579	38.03	-0.39	10.76	48.40	73.00	-24.60	QP
7	0.727	42.63	-0.38	10.78	53.03	73.00	-19.97	QP
8	0.731	34.30	-0.38	10.78	44.70	60.00	-15.30	Average
9	3.364	37.33	-0.45	10.91	47.79	60.00	-12.21	Average
10	3.528	46.08	-0.45	10.90	56.53	73.00	-16.47	QP
11	19.428	48.98	-0.94	10.93	58.97	73.00	-14.03	QP
12	19.428	41.08	-0.94	10.93	51.07	60.00	-8.93	Average

Notes:

1. *An initial pre-scan was performed on the line and neutral lines with peak detector.*
2. *Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.*
3. *Final Level =Receiver Read level + LISN Factor + Cable Loss.*

Product name:	Outdoor Smart UPS	Product model:	EPB41211
Test by:	Carey	Test mode:	Full load mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Neutral
Test voltage:	AC 120 V/60 Hz	Environment:	Temp: 22.5℃ Huni: 55%

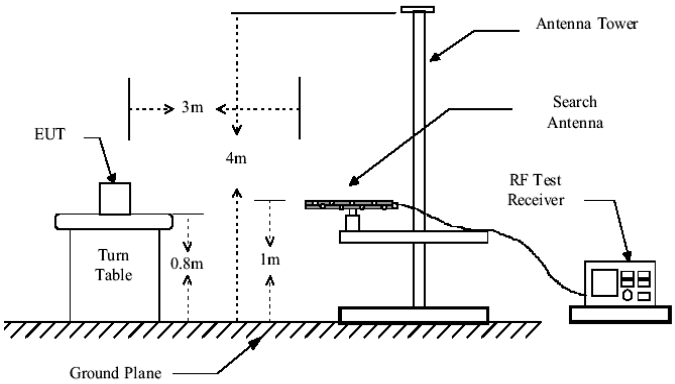
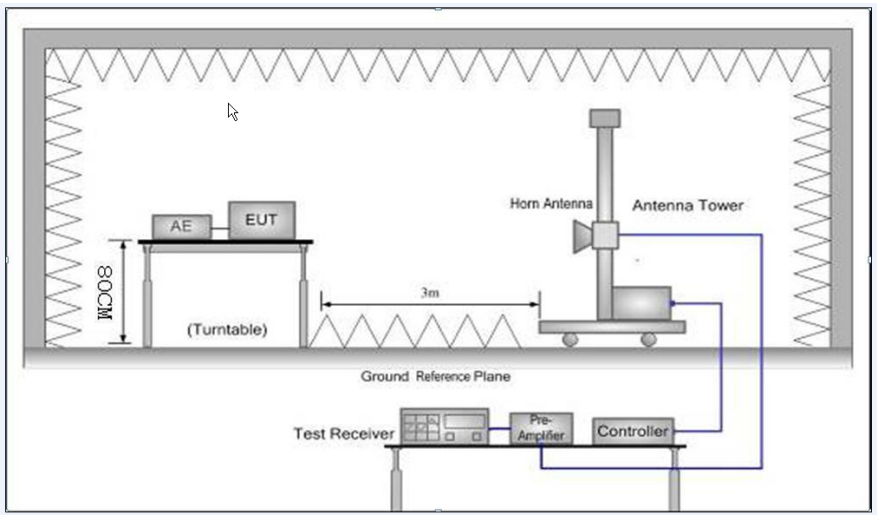


	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.154	49.49	-0.68	10.78	59.59	79.00	-19.41	QP
2	0.154	38.73	-0.68	10.78	48.83	66.00	-17.17	Average
3	0.162	45.99	-0.68	10.77	56.08	79.00	-22.92	QP
4	0.211	34.38	-0.68	10.76	44.46	66.00	-21.54	Average
5	0.385	30.57	-0.64	10.72	40.65	66.00	-25.35	Average
6	0.712	42.23	-0.64	10.78	52.37	73.00	-20.63	QP
7	0.727	32.93	-0.64	10.78	43.07	60.00	-16.93	Average
8	0.783	42.35	-0.64	10.81	52.52	73.00	-20.48	QP
9	3.364	43.34	-0.68	10.91	53.57	73.00	-19.43	QP
10	3.364	35.02	-0.68	10.91	45.25	60.00	-14.75	Average
11	16.486	48.52	-1.01	10.91	58.42	73.00	-14.58	QP
12	18.135	37.88	-1.21	10.92	47.59	60.00	-12.41	Average

Notes:

1. *An initial pre-scan was performed on the line and neutral lines with peak detector.*
2. *Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.*
3. *Final Level =Receiver Read level + LISN Factor + Cable Loss.*

6.2 Radiated Emission

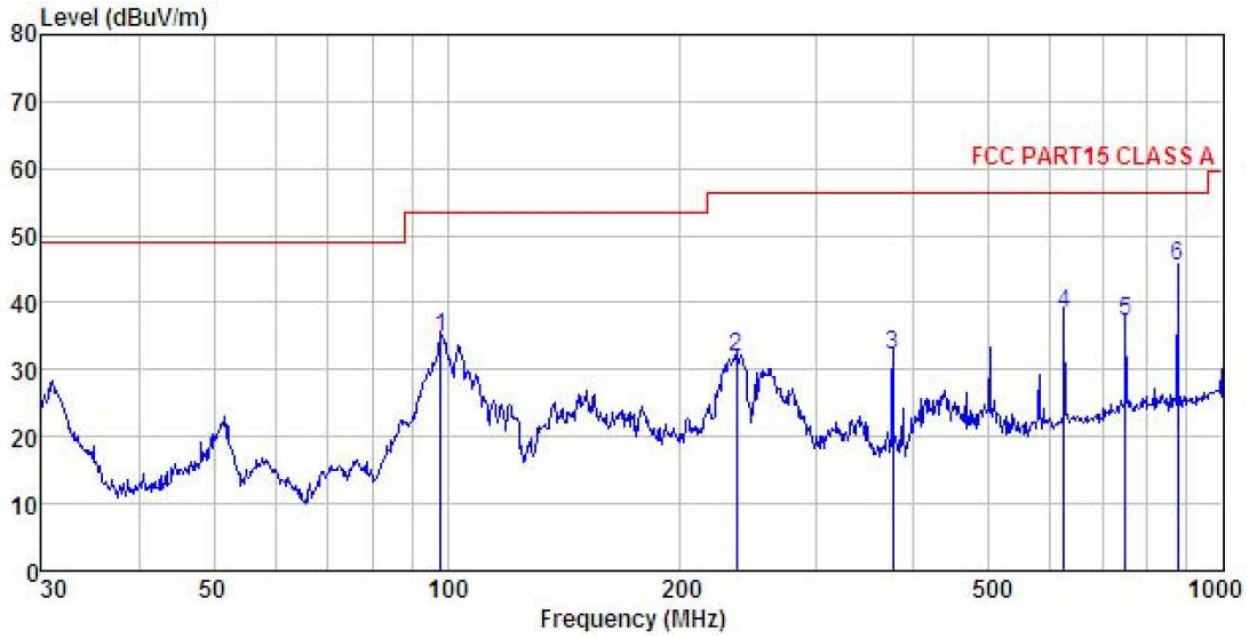
Test Requirement:	FCC Part 15 B Section 15.109				
Test Method:	ANSI C63.4:2014				
Test Frequency Range:	30MHz to 6000MHz				
Class / Severity:	Class A				
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		RMS	1MHz	3MHz	Average Value
Limit:	Frequency	Limit (dBuV/m @3m)			Remark
	30MHz-88MHz	49.0			Quasi-peak Value
	88MHz-216MHz	53.5			Quasi-peak Value
	216MHz-960MHz	56.4			Quasi-peak Value
	960MHz-1GHz	59.5			Quasi-peak Value
	Above 1GHz	59.5			Average Value
		79.5			Peak Value
Test setup:	Below 1GHz  Above 1GHz 				

Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed
Remark:	All of the observed value above 6GHz ware the niose floor , which were no recorded

Measurement Data:

Below 1GHz:

Product Name:	Outdoor Smart UPS	**Product Model:**	EPB41211
Test By:	Carey	**Test mode:**	Full load mode
Test Frequency:	30 MHz ~ 1 GHz	**Polarization:**	Vertical
Test Voltage:	AC 120/60Hz	**Environment:**	Temp: 24℃ Huni: 57%

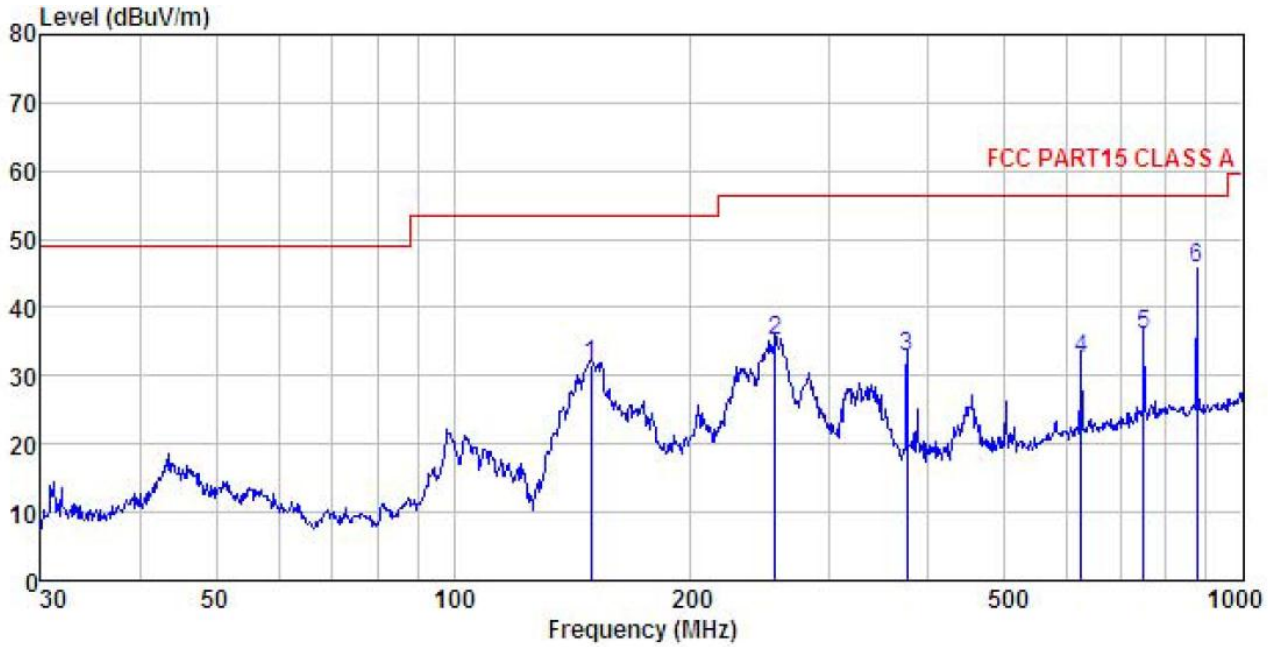


	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	98.142	50.39	12.04	1.97	29.54	34.86	53.50	-18.64	QP
2	235.816	45.42	12.15	2.83	28.62	31.78	56.40	-24.62	QP
3	375.939	42.91	14.97	3.09	28.68	32.29	56.40	-24.11	QP
4	625.078	43.71	19.61	3.90	28.86	38.36	56.40	-18.04	QP
5	750.108	40.86	20.60	4.36	28.48	37.34	56.40	-19.06	QP
6	875.247	46.86	22.55	3.95	27.94	45.42	56.40	-10.98	QP

Remark:

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Product Name:	Outdoor Smart UPS	Product Model:	EPB41211
Test By:	Carey	Test mode:	Full load mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24℃ Huni: 57%



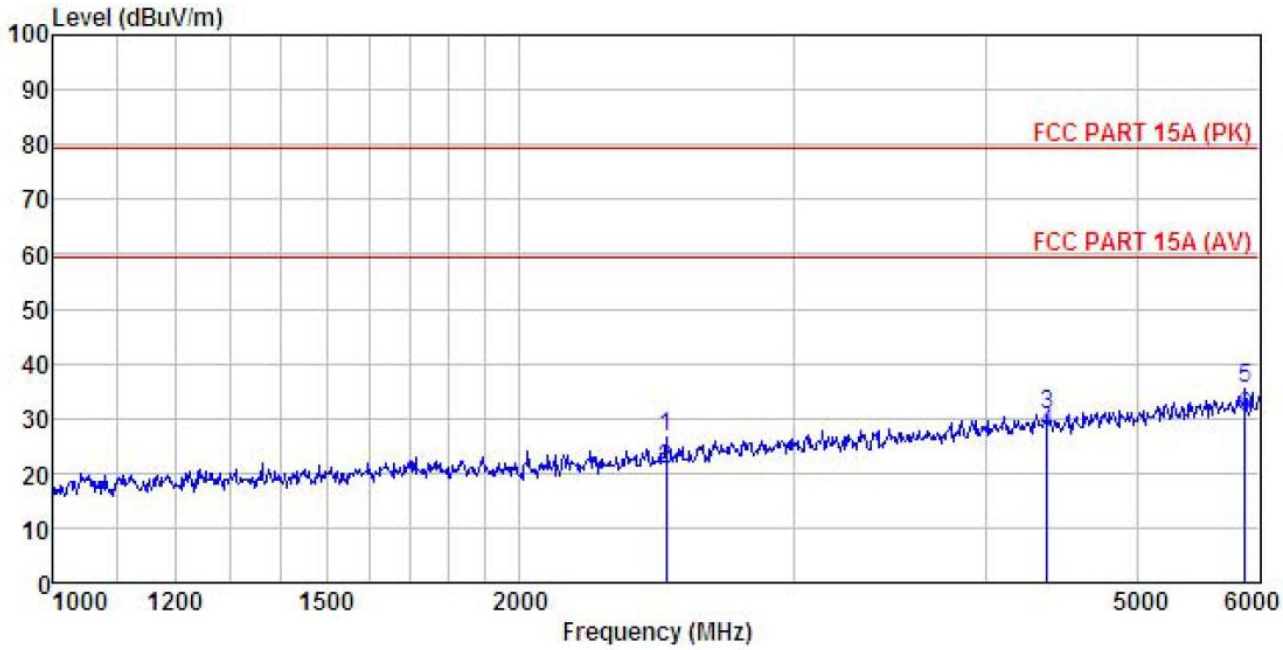
	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	149.486	49.72	8.58	2.51	29.22	31.59	53.50	-21.91	QP
2	255.623	47.56	13.34	2.82	28.53	35.19	56.40	-21.21	QP
3	375.939	43.22	15.08	3.09	28.68	32.71	56.40	-23.69	QP
4	625.078	38.05	19.51	3.90	28.86	32.60	56.40	-23.80	QP
5	750.108	39.25	21.00	4.36	28.48	36.13	56.40	-20.27	QP
6	875.247	48.00	21.81	3.95	27.94	45.82	56.40	-10.58	QP

Remark:

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Above 1GHz:

Product Name:	Outdoor Smart UPS	**Product Model:**	EPB41211
Test By:	Carey	**Test mode:**	Full load mode
Test Frequency:	1 GHz ~ 6 GHz	**Polarization:**	Vertical
Test Voltage:	AC 120/60Hz	**Environment:**	Temp: 24℃ Huni: 57%

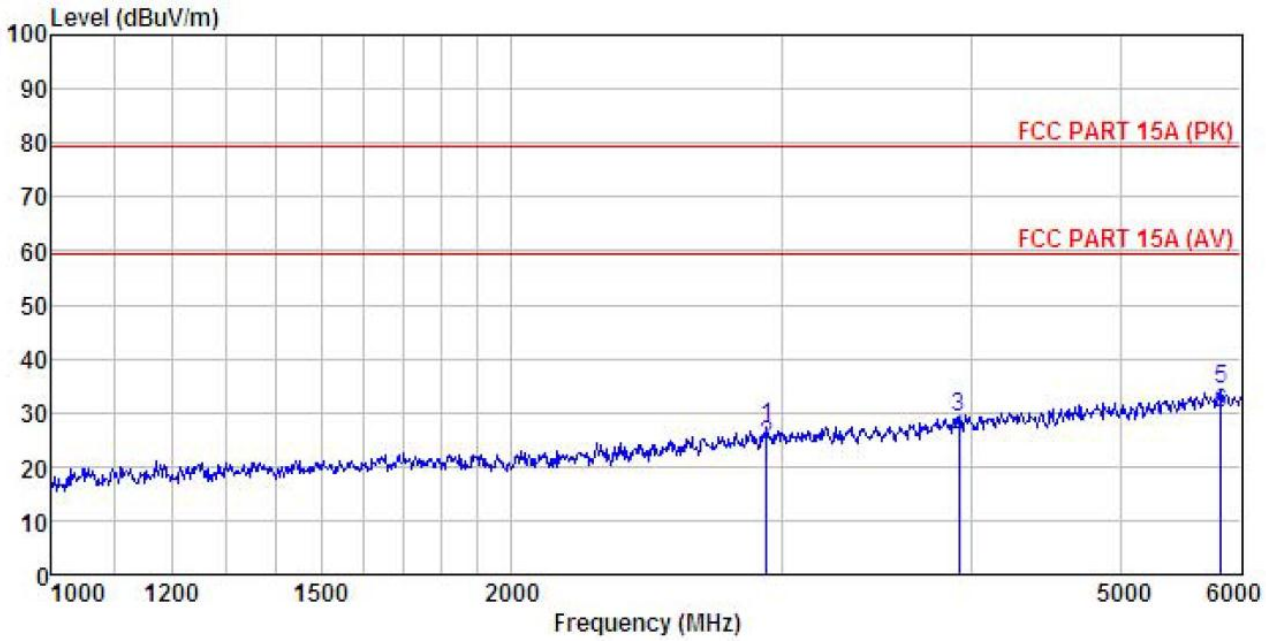


	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2484.854	36.37	27.36	4.81	41.91	26.63	79.50	-52.87	Peak
2	2484.854	30.28	27.36	4.81	41.91	20.54	59.50	-38.96	Average
3	4377.203	35.60	30.38	6.67	41.95	30.70	79.50	-48.80	Peak
4	4377.203	32.15	30.38	6.67	41.95	27.25	59.50	-32.25	Average
5	5872.370	36.70	32.67	7.90	42.03	35.24	79.50	-44.26	Peak
6	5872.370	31.85	32.67	7.90	42.03	30.39	59.50	-29.11	Average

Remark:

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Product Name:	Outdoor Smart UPS	Product Model:	EPB41211
Test By:	Carey	Test mode:	Full load mode
Test Frequency:	1 GHz ~ 6 GHz	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24℃ Huni: 57%



	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	2935.411	35.32	28.37	5.29	41.55	27.43	79.50	-52.07	Peak
2	2935.411	31.83	28.37	5.29	41.55	23.94	59.50	-35.56	Average
3	3924.004	34.91	30.06	6.10	41.80	29.27	79.50	-50.23	Peak
4	3924.004	30.78	30.06	6.10	41.80	25.14	59.50	-34.36	Average
5	5819.996	35.65	32.66	7.89	42.02	34.18	79.50	-45.32	Peak
6	5819.996	31.50	32.66	7.89	42.02	30.03	59.50	-29.47	Average

Remark:

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*