

MEASUREMENT REPORT

FCC PART 15.209

FCC ID: 2AKPK-P2C

APPLICANT: Omnicharge. Inc

Application Type: Certification

Product: PORTABLE POWER BANK

Model No.: Omni 20C+

FCC Classification: Part 15 Low Power Transmitter Below 1705 kHz (DCD)

FCC Rule Part(s): Part15 Subpart C

Test Procedure(s): ANSI C63.10-2013

Test Date: June 19 ~ November 04, 2019

Reviewed By:

(Kevin Guo)

Approved By:

(Robin Wu)



The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
1906RSU026-U1	Rev. 01	Initial Report	06-18-2020	Valid

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§2.1033 General Information

Applicant:	Omnicharge. Inc
Applicant Address:	21731 Ventura Blvd STE 180, Woodland Hills, California, United States
Manufacturer:	Omnicharge. Inc
Manufacturer Address:	21731 Ventura Blvd STE 180, Woodland Hills, California, United States
Test Site:	MRT Technology (Suzhou) Co., Ltd
Test Site Address:	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China

Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Tian'edang Rd., Suzhou, China.

- MRT facility is a FCC registered (MRT Reg. No. 893164) test facility with the site description report on file and has met all the requirements specified in ANSI C63.4-2014.
- MRT facility is an IC registered (MRT Reg. No. 11384A-1) test laboratory with the site description on file at Industry Canada.
- MRT facility is a VCCI registered (R-20025, G-20034, C-20020, T-20020) test laboratory with the site description on file at VCCI Council.
- MRT Lab is accredited to ISO 17025 by the American Association for Laboratory Accreditation (A2LA) under the American Association for Laboratory Accreditation Program (A2LA Cert. No. 3628.01) in EMC, Telecommunications, Radio and SAR testing.



1. INTRODUCTION

1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada and Certification and Engineering Bureau.

1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taihu Lake. These measurement tests were conducted at the MRT Technology (Suzhou) Co., Ltd. Facility located at D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China. The measurement facility compliant with the test site requirements specified in ANSI C63.4-2014.



2. PRODUCT INFORMATION

2.1. Feature of Equipment under Test

Product Name:	PORTABLE POWER BANK
Model No.:	Omni 20C+
Bluetooth Version:	V4.0 Single mode
Wireless Charging:	110kHz ~ 205kHz
Input:	USB-C Port: 5V=3A , 9V=3A, 12V=3A, 15V=3A, 20V=2.25A
Output	USB-C Port: 5V=3A , 9V=3A, 12V=3A, 15V=3A, 20V=3A USB-A Port: 5V=3A , 9V=2A, 12V=1.5A
Accessories	
Battery Pack:	Capacity: 20400mAh

2.2. Test System Details

Auxiliary Equipment Used during Test:

Description	Manufacturer	Model No.	Serial No.	Power Cord
Wireless Charger Receiver	Lineprinting	N/A	N/A	N/A

Note: The Wireless Charger Receiver is provided by the manufacturer, and it can control the EUT to be at the maximum output power state.

2.3. Test mode

Test Mode	Mode 1: Energy transmission (normal operation with client device)
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2.4. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

2.5. Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the FCC ID must be displayed on the device per Section 15.19(a)(5). Please see attachment for FCC ID label and label location.

3. DESCRIPTION OF TEST

3.1. Evaluation Procedure

The measurement procedures described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices (ANSI C63.10-2013) and were used in the measurement.

Deviation from measurement procedure.....None

3.2. AC Line Conducted Emissions

The line-conducted facility is located inside an 8'x4'x4' shielded enclosure. A 1m x 2m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50uH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground-plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the receiver and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The receiver was scanned from 150kHz to 30MHz. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 9kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was also maximized by varying: power lines, the mode of operation or data exchange speed, or support equipment whichever determined the worst-case emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions were used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

An extension cord was used to connect to a single LISN which powered by EUT. The extension cord was calibrated with LISN, the impedance and insertion loss are compliance with the requirements as stated in ANSI C63.10-2013.

3.3. Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the Antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. A MF Model 210SS turntable is used for radiated measurement. It is a continuously rotatable, remote controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm high PVC support structure is placed on top of the turntable. For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive Antenna height using a broadband Antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn Antennas were used. For frequencies below 30MHz, a calibrated loop Antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband Antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up for frequencies below 1GHz was placed on top of the 0.8 meter high, 1 x 1.5 meter table; and test set-up for frequencies 1-40GHz was placed on top of the 1.5 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, if applicable, turntable azimuth, and receive Antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn Antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive Antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive Antenna, whichever produced the worst-case emissions. According to 3dB Beam-Width of horn Antenna, the horn Antenna should be always directed to the EUT when rising height.

4. ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can 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 shall be considered sufficient to comply with the provisions of this section.”

- The antenna of the unit is **permanently attached**.
- There are no provisions for connection to an external antenna.

Conclusion:

The unit complies with the requirement of §15.203.

5. TEST EQUIPMENT CALIBRATION DATE

Conducted Emissions - SR2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06185	1 year	2020/04/15
Two-Line V-Network	R&S	ENV 216	MRTSUE06002	1 year	2020/06/13
Two-Line V-Network	R&S	ENV 216	MRTSUE06003	1 year	2020/06/13
Thermohygrometer	Testo	608-H1	MRTSUE06404	1 year	2020/08/08
Shielding Chamber	MIX-BEP	Chamber-SR2	MRTSUE06215	N/A	N/A

Radiated Emissions - AC1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2020/08/01
PXA Signal Analyzer	Keysight	9030B	MRTSUE06395	1 year	2020/09/03
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2019/11/09
Bilog Period Antenna	Schwarzbeck	VULB 9168	MRTSUE06172	1 year	2020/03/31
Broad Band Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06023	1 year	2020/10/13
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06024	1 year	2019/12/17
Microwave System Amplifier	Agilent	83017A	MRTSUE06076	1 year	2019/11/16
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2020/06/11
Thermohygrometer	Testo	608-H1	MRTSUE06403	1 year	2020/08/08
Anechoic Chamber	TDK	Chamber-AC1	MRTSUE06213	1 year	2020/04/30

Radiated Emission - AC2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Keysight	N9038A	MRTSUE06125	1 year	2020/08/01
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2019/11/09
Bilog Period Antenna	Schwarzbeck	VULB 9162	MRTSUE06022	1 year	2020/10/13
Horn Antenna	Schwarzbeck	BBHA9120D	MRTSUE06171	1 year	2019/11/09
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06024	1 year	2019/12/17
Broadband Coaxial Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06176	1 year	2019/11/16
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2020/06/11
Temperature/Humidity Meter	Minggao	ETH529	MRTSUE06170	1 year	2019/12/13
Anechoic Chamber	RIKEN	Chamber-AC2	MRTSUE06213	1 year	2020/04/30

Software	Version	Function
EMI Software	V3	EMI Test Software

6. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

AC Conducted Emission Measurement - SR2
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_{c(y)}$): 9kHz~150kHz: 3.84dB 150kHz~30MHz: 3.46dB
Radiated Emission Measurement - AC1
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_{c(y)}$): Horizontal: 30MHz~300MHz: 4.07dB 300MHz~1GHz: 3.63dB 1GHz~18GHz: 4.16dB Vertical: 30MHz~300MHz: 4.18dB 300MHz~1GHz: 3.60dB 1GHz~18GHz: 4.76dB
Radiated Emission Measurement - AC2
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_{c(y)}$): Horizontal: 30MHz~300MHz: 3.75dB 300MHz~1GHz: 3.53dB 1GHz~18GHz: 4.28dB Vertical: 30MHz~300MHz: 3.86dB 300MHz~1GHz: 3.53dB 1GHz~18GHz: 4.33dB

7. TEST RESULT

7.1. Summary

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.207	AC Conducted Emissions 150kHz - 30MHz	< FCC 15.207 limits	Line Conducted	Pass	Section 7.2
15.209	General Field Strength Limits	FCC Part 15.209 limits		Pass	Section 7.3
15.215(c)	20dB Spectrum Bandwidth	20 dB bandwidth of the emission in the specific band	Radiated	Pass	Section 7.4

Notes:

- 1) For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst-case emissions.
- 2) During AC Conducted emission testing, AC-DC adapter is provided by manufacturer, but it's not for sale with EUT.

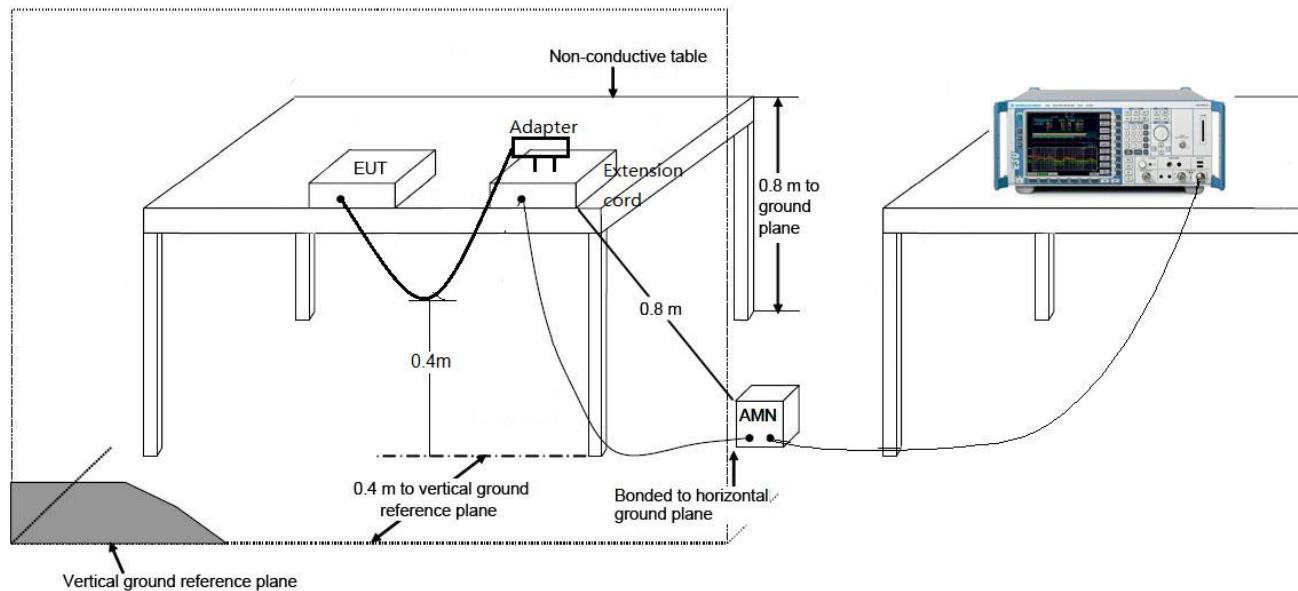
7.2. Conducted Emission

7.2.1. Test Limit

FCC 15.207 Limits		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 ~ 0.50	66 ~ 56	56 ~ 46
0.50 ~ 5.0	56	46
5.0 ~ 30	60	50

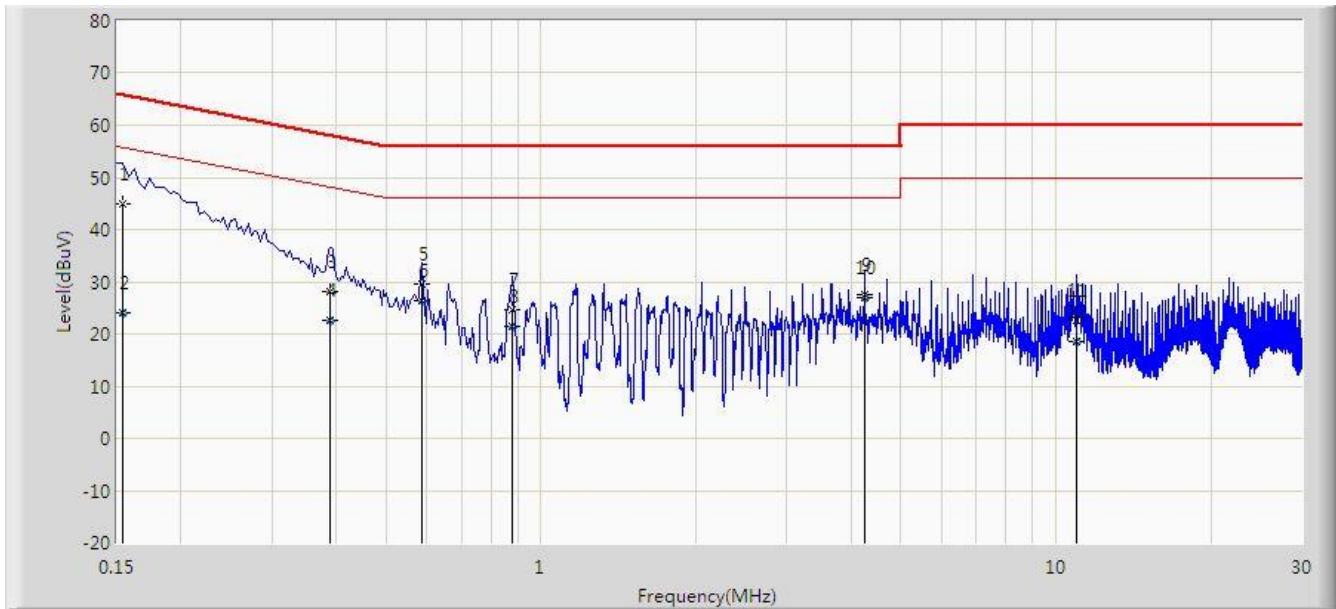
Note 1: The lower limit shall apply at the transition frequencies.
Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

7.2.2. Test Setup



7.2.3. Test Result

Site: SR2	Time: 2019/11/04 - 14:56
Limit: FCC_Part15.207_CE_AC Power	Engineer: Liz Yuan
Probe: ENV216_101683_Filter On	Polarity: Line
EUT: PORTABLE POWER BANK	Power: AC 120V/60Hz
Test Mode: Energy transmission	

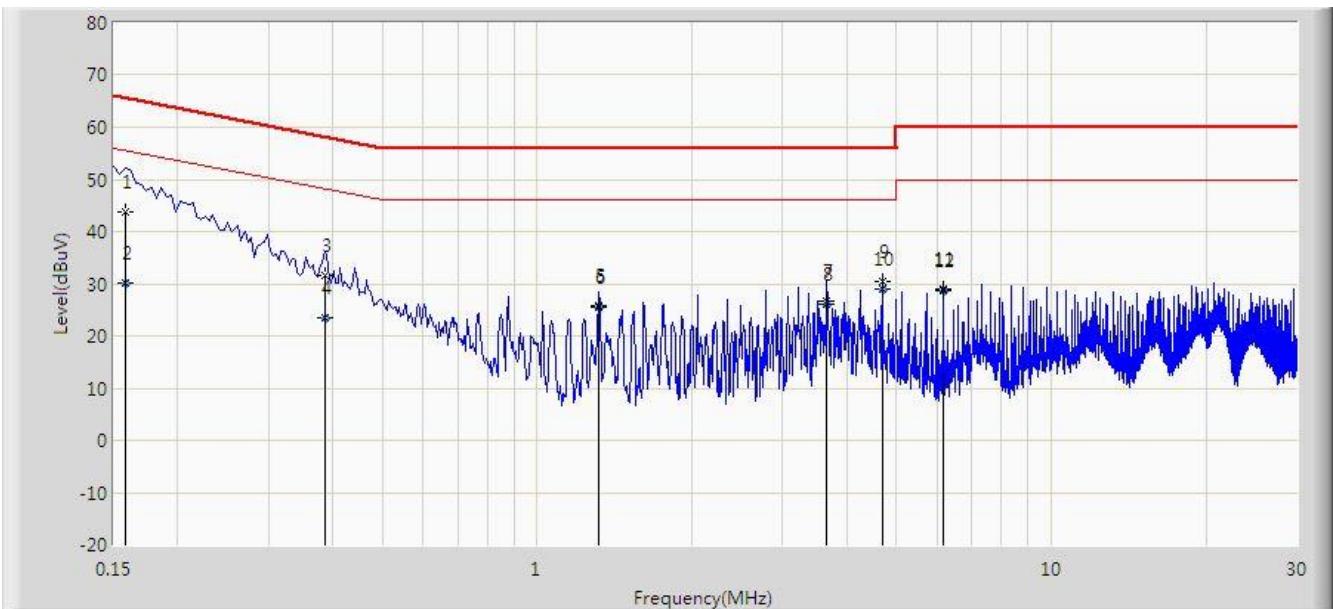


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.154	44.882	34.142	-20.900	65.781	10.740	QP
2			0.154	24.179	13.439	-31.602	55.781	10.740	AV
3			0.390	28.022	17.945	-30.041	58.064	10.077	QP
4			0.390	22.605	12.528	-25.459	48.064	10.077	AV
5			0.586	29.685	19.563	-26.315	56.000	10.122	QP
6			0.586	26.494	16.372	-19.506	46.000	10.122	AV
7			0.882	24.603	14.633	-31.397	56.000	9.970	QP
8			0.882	21.562	11.592	-24.438	46.000	9.970	AV
9			4.254	27.529	17.551	-28.471	56.000	9.977	QP
10	*		4.254	26.853	16.876	-19.147	46.000	9.977	AV
11			10.998	22.721	12.613	-37.279	60.000	10.107	QP
12			10.998	18.438	8.330	-31.562	50.000	10.107	AV

Note: Measure Level (dB μ V) = Reading Level (dB μ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

Site: SR2	Time: 2019/11/04 - 15:03
Limit: FCC_Part15.207_CE_AC Power	Engineer: Liz Yuan
Probe: ENV216_101683_Filter On	Polarity: Neutral
EUT: PORTABLE POWER BANK	Power: AC 120V/60Hz
Test Mode: Energy transmission	



No	Flag	Mark	Frequency (MHz)	Measure Level (dB μ V)	Reading Level (dB μ V)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.158	43.648	33.358	-21.921	65.568	10.290	QP
2			0.158	30.270	19.981	-25.298	55.568	10.290	AV
3			0.386	31.522	21.420	-26.628	58.149	10.102	QP
4			0.386	23.373	13.271	-24.776	48.149	10.102	AV
5			1.318	25.751	15.854	-30.249	56.000	9.897	QP
6			1.318	25.522	15.625	-20.478	46.000	9.897	AV
7			3.662	26.746	16.807	-29.254	56.000	9.939	QP
8			3.662	26.211	16.272	-19.789	46.000	9.939	AV
9			4.686	30.557	20.542	-25.443	56.000	10.015	QP
10	*		4.686	29.055	19.040	-16.945	46.000	10.015	AV
11			6.150	29.040	18.915	-30.960	60.000	10.125	QP
12			6.150	28.619	18.494	-21.381	50.000	10.125	AV

Note: Measure Level (dB μ V) = Reading Level (dB μ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

7.3. General Radiated Emission

7.3.1. Test Limit

FCC Part 15.209 Limit		
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 80	100	3
80 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

Note 1: The lower limit shall apply at the transition frequency.
Note 2: Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
Note 3: E field strength (dBuV/m) = 20 log E field strength (uV/m).

7.3.2. Test Procedure Used

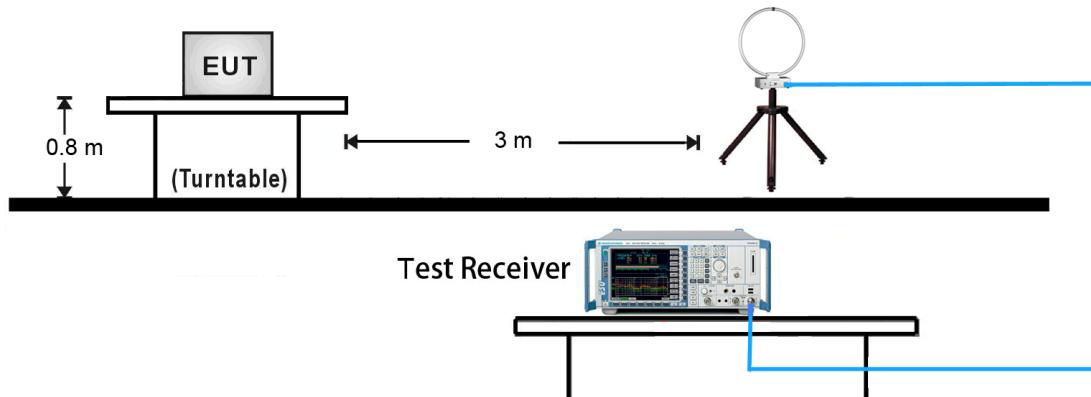
ANSI C63.10 - Section 6.3 (General Requirements)

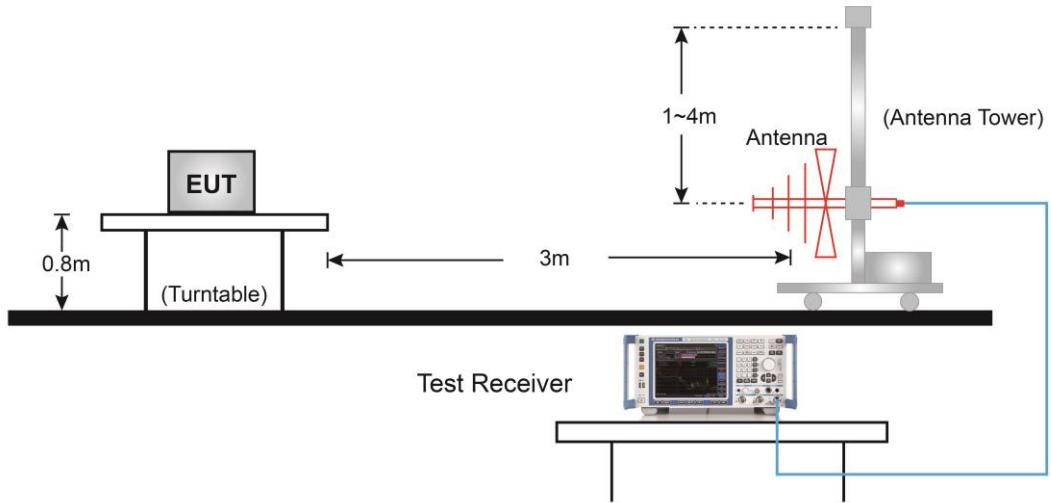
ANSI C63.10 - Section 6.4 (Standard test method below 30MHz)

ANSI C63.10 - Section 6.5 (Standard test method above 30MHz to 1GHz)

7.3.3. Test Setup

Below 30MHz Test Setup:



30MHz ~ 1GHz Test Setup:

7.3.4. Test Result

Product	PORTABLE POWER BANK		Temperature	25°C		
Test Engineer	Snake Ni		Relative Humidity	52%		
Test Site	AC2		Test Date	2019/06/20 ~ 2019/10/15		
Test Mode	Energy transmission					

Frequency (MHz)	Reading Level (dB μ V)	Factor (dB)	Measure Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector	Polarization
Fundamental Radiated Emission							
0.142	59.971	20.188	80.159	104.558	-24.399	Peak	Face On
Radiated Spurious Emission							
0.094	22.508	20.226	42.734	108.142	-65.408	Peak	Face On
0.150	35.798	20.188	55.986	104.082	-48.096	Peak	Face On
0.419	37.021	20.335	57.356	95.160	-37.804	Peak	Face On
43.095	3.207	14.363	17.570	40.000	-22.430	QP	Horizontal
98.385	2.995	12.646	15.641	43.500	-27.859	QP	Horizontal
105.660	2.841	12.953	15.794	43.500	-27.706	QP	Horizontal
464.560	9.936	17.370	27.306	46.000	-18.694	QP	Horizontal
487.840	8.906	17.790	26.696	46.000	-19.304	QP	Horizontal
616.365	8.580	19.869	28.449	46.000	-17.551	QP	Horizontal
35.820	14.691	13.029	27.720	40.000	-12.280	QP	Vertical
42.125	5.628	14.184	19.812	40.000	-20.188	QP	Vertical
63.950	4.727	12.787	17.514	40.000	-22.486	QP	Vertical
103.235	3.204	13.029	16.233	43.500	-27.267	QP	Vertical
241.460	7.592	13.240	20.832	46.000	-25.168	QP	Vertical
534.885	4.395	18.478	22.873	46.000	-23.127	QP	Vertical
Note 1: Measure Level (dB μ V/m) = Reading Level (dB μ V) + Factor (dB)							
Note 2: Below 30MHz, the loop antenna was positioned in 3 orthogonal planes (X (face on), Y (face off), Z (top)) to determine the orientation resulting in the worst-case emission.							

7.4. 20dB Spectrum Bandwidth Measurement

7.4.1. Test Limit

N/A

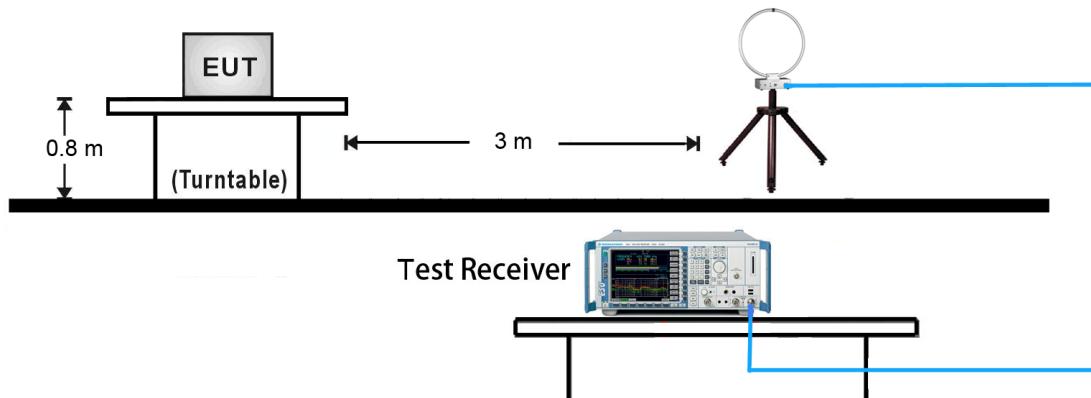
7.4.2. Test Procedure Used

ANSI C63.10 Clause 6.9.2

7.4.3. Test Setting

1. Set the spectrum span range to overlap the nominal center frequency
2. Set RBW = 1% ~ 5% of the OBW
3. VBW $\geq 3 \times$ RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. Allow the trace was allowed to stabilize and marker the highest level.
8. Determine the display level (the highest level - 20dB) and place two markers, one at the lowest frequency and the other at the highest frequency.

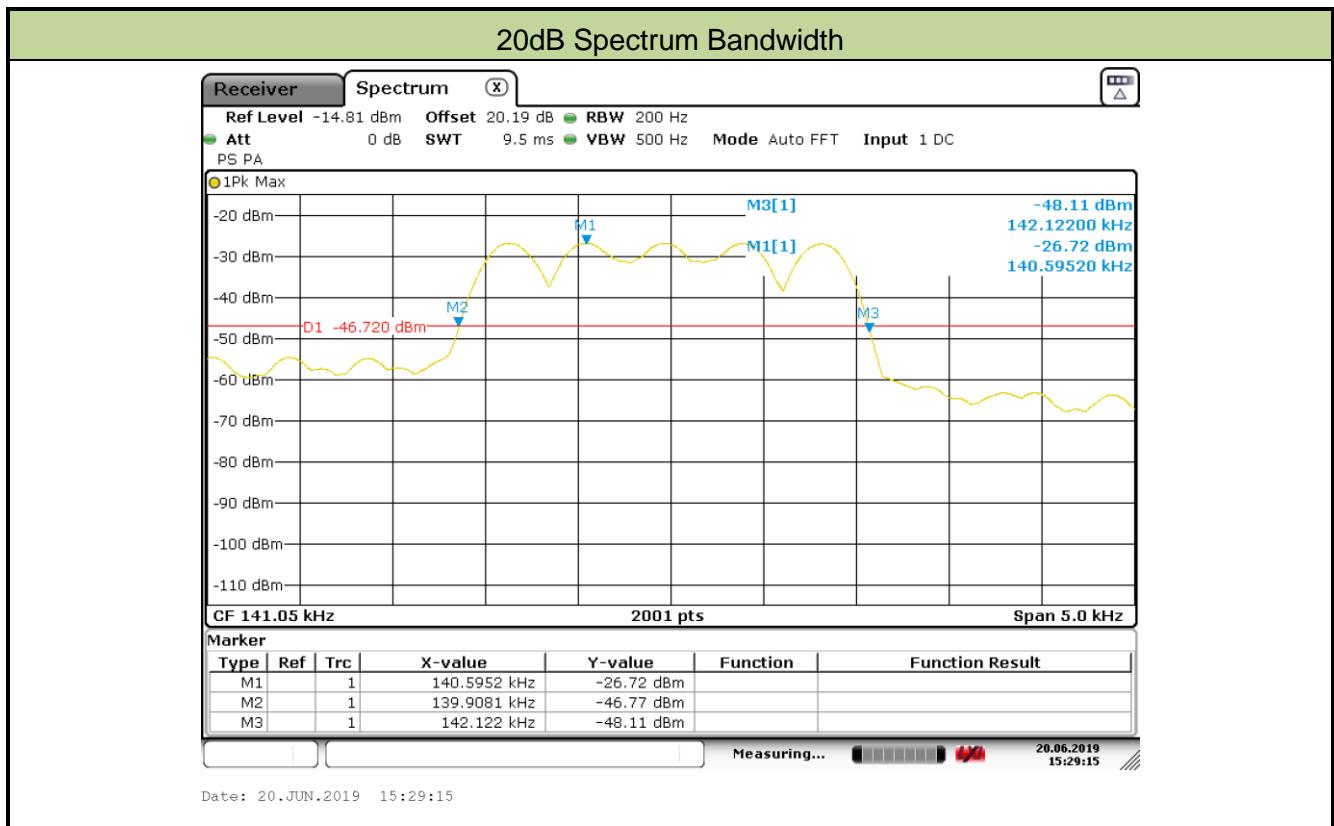
7.4.4. Test Setup



7.4.5. Test Result

Product	PORTABLE POWER BANK	Temperature	25°C
Test Engineer	Snake Ni	Relative Humidity	52%
Test Site	AC2	Test Date	2019/06/20

Low Frequency (KHz)	High Frequency (KHz)	Result
139.908	142.122	Pass



8. CONCLUSION

The data collected relate only the item(s) tested and show that the unit is compliance with Part 15C of the FCC rules.

The End

Appendix A - Test Setup Photograph

Refer to "1906RSU026-UT" file.

Appendix B - EUT Photograph

Refer to "1906RSU026-UE" file.