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# FCC Test Report

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Report No.: AGC01741220406FE04

**FCC ID** : 2AYT3-EB55

**APPLICATION PURPOSE** : Original Equipment

**PRODUCT DESIGNATION** : Portable Power Station

**BRAND NAME** : BLUETTI

**MODEL NAME** : EB55

**APPLICANT** : SHENZHEN POWEROAK NEWENER CO., LTD

**DATE OF ISSUE** : May 24, 2022

**STANDARD(S)** : FCC Part 15 Rules

**TEST PROCEDURE(S)**

**REPORT VERSION** : V1.0

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**REPORT REVISE RECORD**

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	May 24, 2022	Valid	Initial Release

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## 1. VERIFICATION OF CONFORMITY

<b>Applicant</b>	SHENZHEN POWEROAK NEWENER CO., LTD
<b>Address</b>	19th floor, Tower 1, Kaider Building, Tongsha Road No.168, XiLi Town, Nanshan District, Shenzhen, China
<b>Manufacturer</b>	SHENZHEN POWEROAK NEWENER CO., LTD
<b>Address</b>	19th floor, Tower 1, Kaider Building, Tongsha Road No.168, XiLi Town, Nanshan District, Shenzhen, China
<b>Factory</b>	Huizhou PowerOak Innovation Co., Ltd
<b>Address</b>	(No.1 Workshop) Longsheng 5th Road, Laoshe Village, Dayawan West Zone 516083 Huizhou City, Guangdong Province, P.R. China
<b>Product Designation</b>	Portable Power Station
<b>Brand Name</b>	BLUETTI
<b>Test Model</b>	EB55
<b>Date of test</b>	May 05, 2022 to May 24, 2022
<b>Deviation</b>	No any deviation from the test method
<b>Condition of Test Sample</b>	Normal
<b>Test Result</b>	Pass
<b>Report Template</b>	AGCRT-US-BR/RF

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with Section 15.207, 15.209, 15.203 of the FCC Part 15, Subpart C Rules.

The results of testing in this report apply to the product/system which was tested only.

Prepared By



Eder Zhan  
(Project Engineer)

May 24, 2022

Reviewed By



Calvin Liu  
(Reviewer)

May 24, 2022

Approved By



Max Zhang  
(Authorized Officer)

May 24, 2022

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## 2. GENERAL INFORMATION

### 2.1. PRODUCT DESCRIPTION

A major technical description of EUT is described as following

<b>Operation Frequency</b>	115-205kHz
<b>Test Frequency</b>	131KHz
<b>Maximum field strength</b>	77.70dBuV/m(AV)@3m
<b>Modulation</b>	FSK
<b>Number of channels</b>	1
<b>Antenna Designation</b>	Coil Antenna (Met 15.203 Antenna requirement)
<b>Hardware Version</b>	V2.0
<b>Software Version</b>	V2.0
<b>Power Supply</b>	Input: DC MPPT: 12-28VDC, 8A Adapter: 25-28VDC, 10A Output: ACx4: 100-120VAC, 50/60Hz, 700W Total USB-Ax4: 5VDC, 3A Total USB-C: 5-20VDC, 3A; 20VDC, 5A (E-Marker chipbuilt-in) DC 5521x2: 12VDC,10A Total Cigarette Lighter : 12VDC, 10A (DC 5521 and Cigarette Lighter 10A Total)
<b>Wireless charger</b>	5W / 7.5W / 10W / 15W

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### 3. MEASUREMENT UNCERTAINTY

The uncertainty is calculated using the methods suggested in the “Guide to the Expression of Uncertainty in measurement” (GUM) published by CISPR and ANSI.

- Uncertainty of Conducted Emission,  $U_c = \pm 3.2$  dB
- Uncertainty of Radiated Emission below 1GHz,  $U_c = \pm 3.9$  dB
- Uncertainty of Radiated Emission above 1GHz,  $U_c = \pm 4.8$  dB

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#### 4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Full Load
2	Half Load
3	Null Load
Note: Wireless output: 5W, 7.5W, 10W, 15W (maximum wireless output 15W during charging)	

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## 5. SYSTEM TEST CONFIGURATION

### 5.1. CONFIGURATION OF EUT SYSTEM

Configure :



### 5.2. EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	Portable Power Station	EB55	2AYT3-EB55	EUT

### 5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.209	Radiated Emission	Compliant
§15.215	20dB bandwidth	Compliant
§15.207	Conducted Emission	Compliant

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## 6. TEST FACILITY

<b>Test Site</b>	Attestation of Global Compliance (Shenzhen) Co., Ltd
<b>Location</b>	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
<b>Designation Number</b>	CN1259
<b>FCC Test Firm Registration Number</b>	975832
<b>A2LA Cert. No.</b>	5054.02
<b>Description</b>	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by A2LA

### TEST EQUIPMENT OF CONDUCTED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	Sep. 06, 2021	Sep. 05, 2022
LISN	R&S	ESH2-Z5	100086	Jun. 09, 2021	Jun. 08, 2022
Test software	R&S	ES-K1(Ver.V1.71)	N/A	N/A	N/A

### TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	Sep. 06, 2021	Sep. 05, 2022
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Nov. 17, 2021	Nov. 16, 2022
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	Mar. 12, 2022	Mar. 11, 2024
ANTENNA	SCHWARZBECK	VULB9168	D69250	Apr. 28, 2021	Apr. 27, 2023
Test software	FARA	EZ EMC (Ver.RA-03A)	N/A	N/A	N/A

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## 7. RADIATED EMISSION

### 7.1 TEST LIMIT

#### Standard FCC 15.209

Frequency (MHz)	Distance Meters	Field Strengths Limit	
		μ V/m	dB(μV)/m
0.009 ~ 0.490	300	2400/F(kHz)	---
0.490 ~ 1.705	30	24000/F(kHz)	---
1.705 ~ 30	30	30	---
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	Other:74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	
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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## 7.2. MEASUREMENT PROCEDURE

1. 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 emissions, 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. 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.

The following table is the setting of spectrum analyzer and receiver.

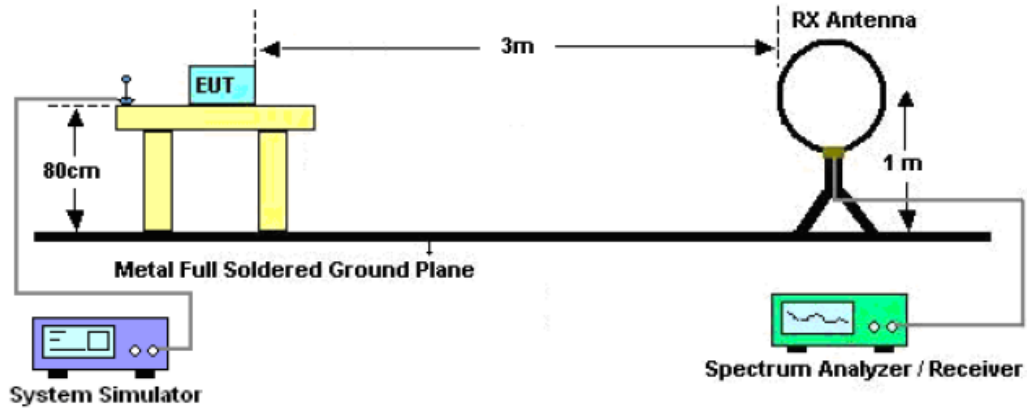
Spectrum Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

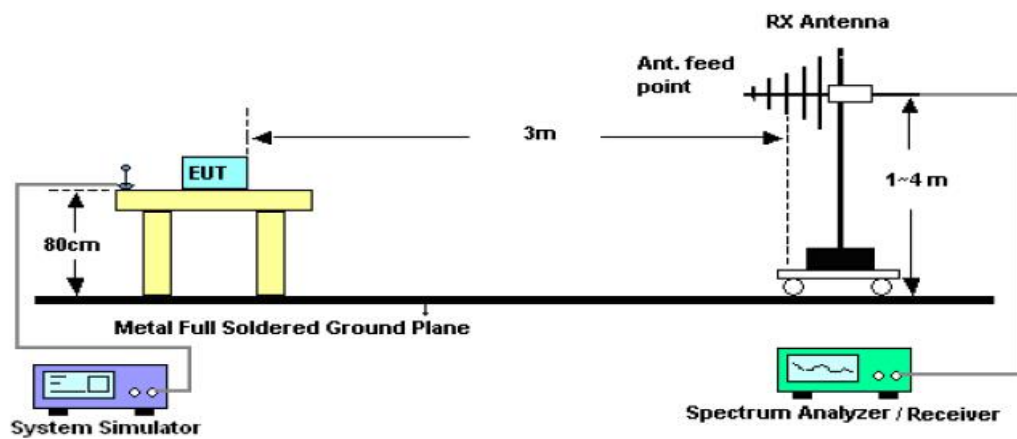
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### 7.3. TEST SETUP

#### Radiated Emission Test-Setup Frequency Below 30MHz



#### RADIATED EMISSION TEST SETUP 30MHz-1000MHz



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#### 7.4. TEST RESULT

Frequency MHz	Polarization	Reading dB(uV) PK	Factor dB (1/m)	Level dB(uV/m) PK	Limit dB(uV/m) AV	Margin dB	Pass/Fail
0.131	Face	56.01	21.53	77.70	105.26	-27.56	Pass
0.131	Side	34.26	21.53	55.76	105.26	-49.50	Pass
0.127	Face	25.15	21.56	46.65	105.53	-58.88	Pass
0.127	Side	22.74	21.56	44.32	105.53	-61.21	Pass
0.122	Face	19.64	21.48	41.10	105.88	-64.78	Pass
0.122	Side	18.32	21.48	39.83	105.88	-66.05	Pass

#### RADIATED EMISSION BELOW 30MHZ

Note1: The amplitude of spurious emissions from 9kHz to 30MHz which are attenuated more than 20 dB below the permissible value need not be reported. The peak level of the emission is less than the average limit, so the average level shall be less than the limit without test.

Note 2:  $\text{Level(dBuV/m)} = \text{Reading(dBuV)} + \text{Factor(dB/m)}$

$\text{Factor(dB/m)} = \text{Antenna Factor(dB/m)} + \text{Cable loss(dB)} + \text{Attenuation(dB) for Attenuator}$

$\text{Margin} = \text{Level} - \text{Limit}$

For 0.131MHz

$\text{Limit(dBuV/m)} = 20\log(2400/F(\text{kHz})) + 40\log(300/3) = 105.26\text{dBuV/m.}$

For 0.127MHz

$\text{Limit(dBuV/m)} = 20\log(2400/F(\text{kHz})) + 40\log(300/3) = 105.53\text{dBuV/m.}$

For 0.122MHz

$\text{Limit(dBuV/m)} = 20\log(2400/F(\text{kHz})) + 40\log(300/3) = 105.88\text{dBuV/m.}$

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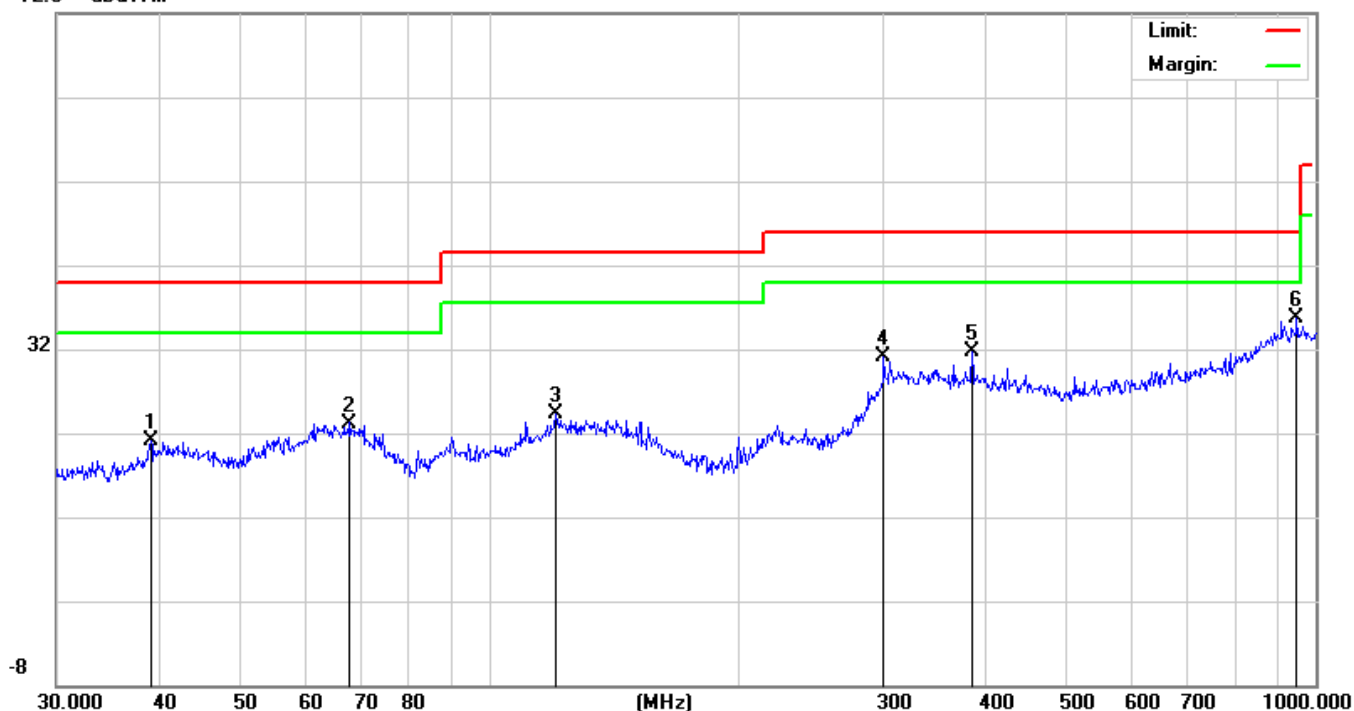
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### RADIATED EMISSION 30MHz- 1GHz

EUT :	Portable Power Station	Model Name.	EB55
Temperature :	25°C	Relative Humidity:	55%
Pressure :	1010 hPa	Test Voltage :	DC 28V
Test Mode :	Mode 1	Polarization :	Horizontal

72.0 dBuV/m



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		39.0245	5.52	15.55	21.07	40.00	-18.93	peak
2		67.9128	5.22	17.98	23.20	40.00	-16.80	peak
3		120.2766	5.32	18.97	24.29	43.50	-19.21	peak
4		300.3672	6.62	24.44	31.06	46.00	-14.94	peak
5		383.9318	7.85	23.80	31.65	46.00	-14.35	peak
6	*	948.7609	6.75	28.91	35.66	46.00	-10.34	peak

**RESULT: PASS**

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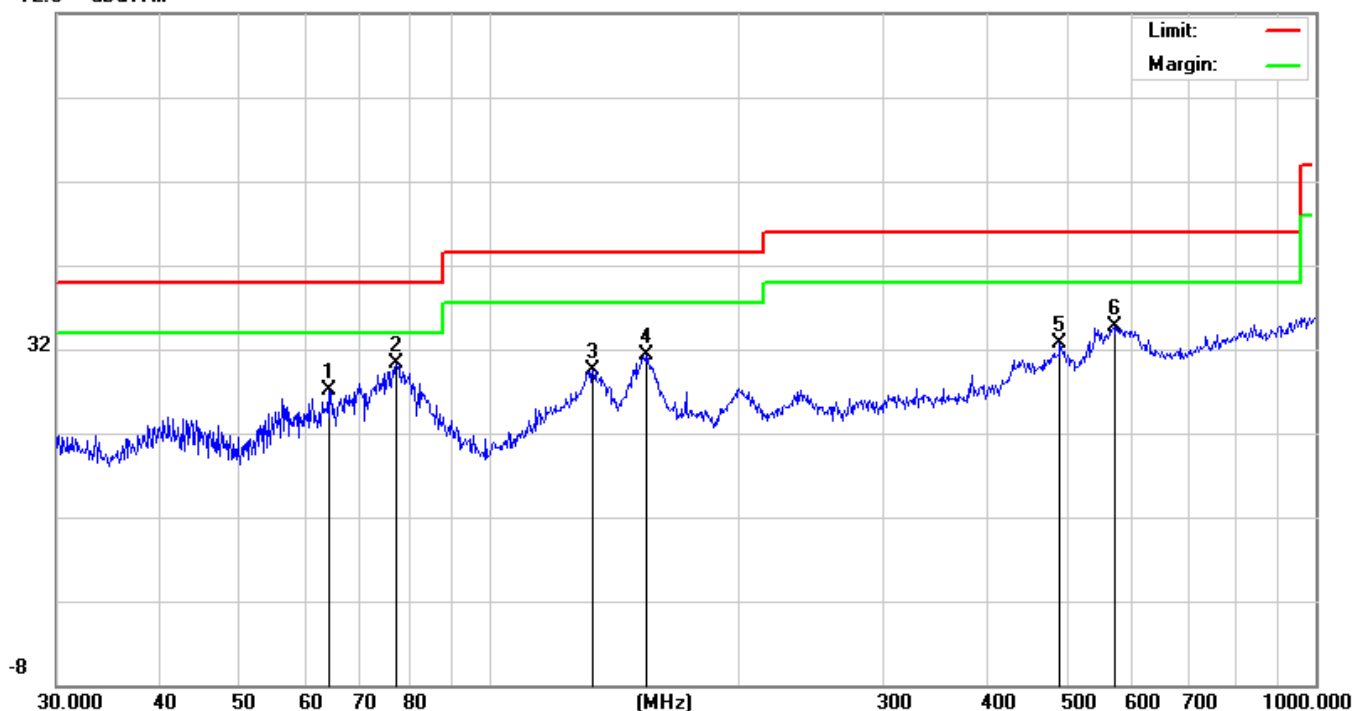
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EUT :	Portable Power Station	Model Name.	EB55
Temperature :	25°C	Relative Humidity:	55%
Pressure :	1010 hPa	Test Voltage :	DC 28V
Test Mode :	Mode 1	Polarization :	Vertical

72.0 dBuV/m



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		63.9828	9.14	17.97	27.11	40.00	-12.89	peak
2	*	77.3212	13.79	16.52	30.31	40.00	-9.69	peak
3		133.6188	10.31	19.15	29.46	43.50	-14.04	peak
4		155.3644	13.65	17.66	31.31	43.50	-12.19	peak
5		490.7447	10.00	22.71	32.71	46.00	-13.29	peak
6		570.6100	9.65	25.08	34.73	46.00	-11.27	peak

## RESULT: PASS

### Note:

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

The "Factor" value can be calculated automatically by software of measurement system.

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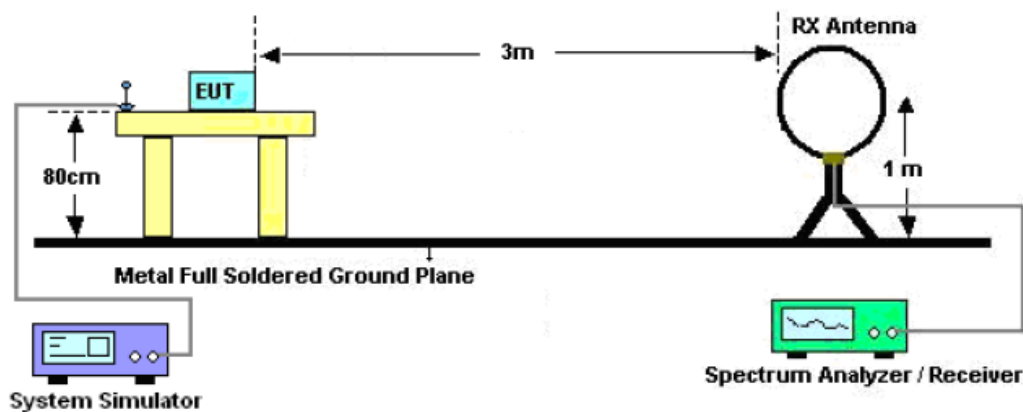


## 8. 20DB BANDWIDTH

### 8.1. MEASUREMENT PROCEDURE

1. The EUT was placed on the top of the turntable 0.8 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. Set the EUT Work on operation frequency.
3. Set Span = approximately 2 to 5 times the 20 dB bandwidth, centered on a channel  
The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW; Sweep = auto; Detector function = peak
4. Set SPA Trace 1 Max hold, then View.

### 8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



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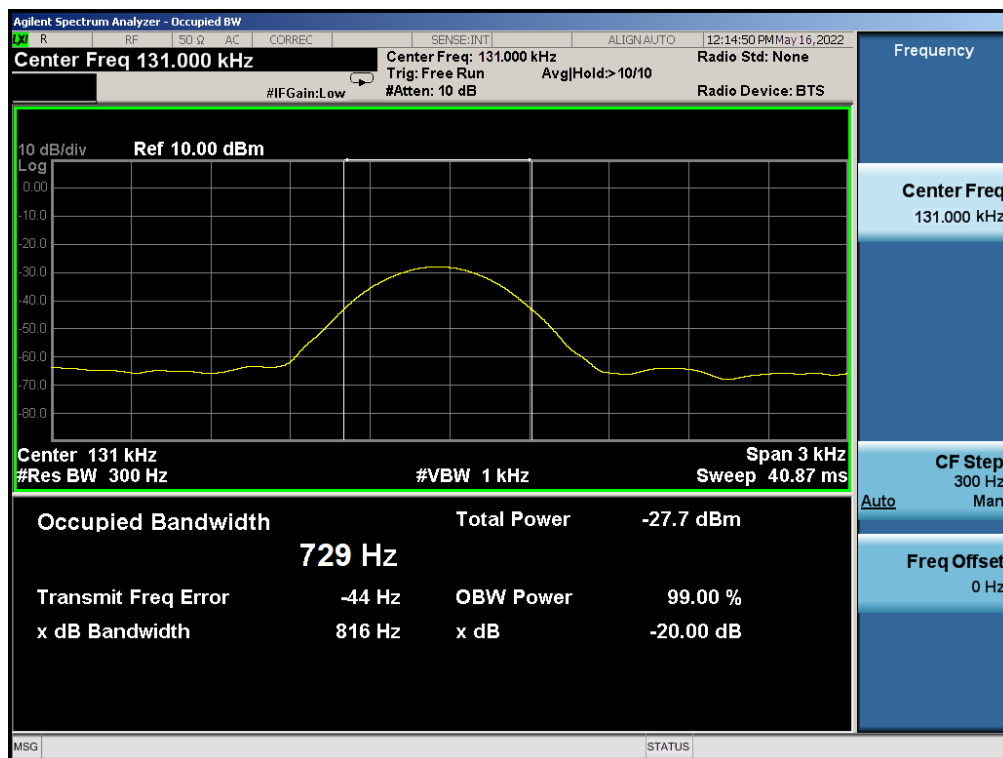


### 8.3. MEASUREMENT RESULTS

TEST ITEM	20DB BANDWIDTH
TEST MODULATION	FSK

Test Data (KHz)		Criteria
Operate Channel	0.816	PASS

### TEST PLOT OF BANDWIDTH



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## 9. FCC LINE CONDUCTED EMISSION TEST

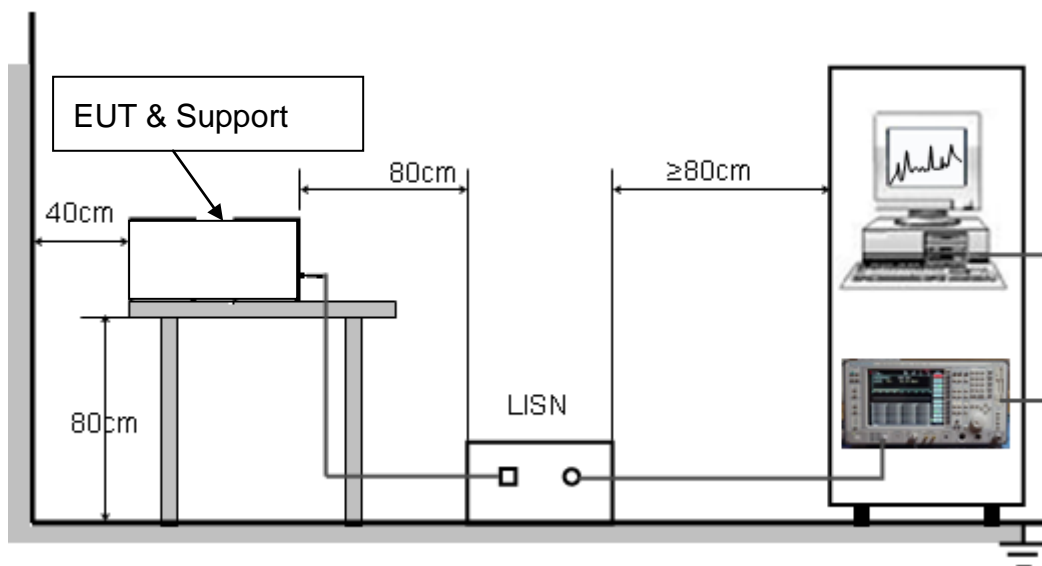
### 9.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.( dBuV)	Average( dBuV)
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 0.50MHz.

### 9.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



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### 9.3. 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 equipments received AC120V/60Hz power from a LISN, if any.
5. The EUT received charging voltage by adapter which received 120V/60Hz power by 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.

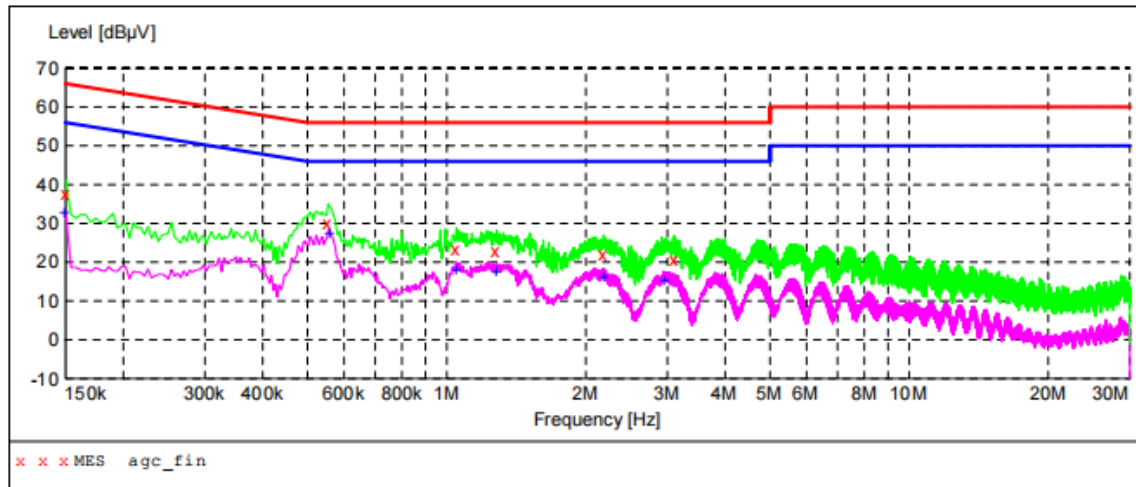
Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

### 9.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. 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.

## 9.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

### LINE CONDUCTED EMISSION TEST-L



#### MEASUREMENT RESULT: "agc\_fin"

2022/5/11 18:35

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	37.80	11.3	66	28.2	QP	L1	GND
0.554000	30.00	11.3	56	26.0	QP	L1	GND
1.050000	23.30	11.3	56	32.7	QP	L1	GND
1.282000	22.80	11.3	56	33.2	QP	L1	GND
2.186000	21.80	11.3	56	34.2	QP	L1	GND
3.106000	20.80	11.4	56	35.2	QP	L1	GND

#### MEASUREMENT RESULT: "agc\_fin2"

2022/5/11 18:35

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	32.90	11.3	56	23.1	AV	L1	GND
0.558000	27.50	11.3	46	18.5	AV	L1	GND
1.050000	17.80	11.3	46	28.2	AV	L1	GND
1.282000	17.50	11.3	46	28.5	AV	L1	GND
2.182000	16.10	11.3	46	29.9	AV	L1	GND
2.962000	15.40	11.4	46	30.6	AV	L1	GND

**RESULT: PASS**

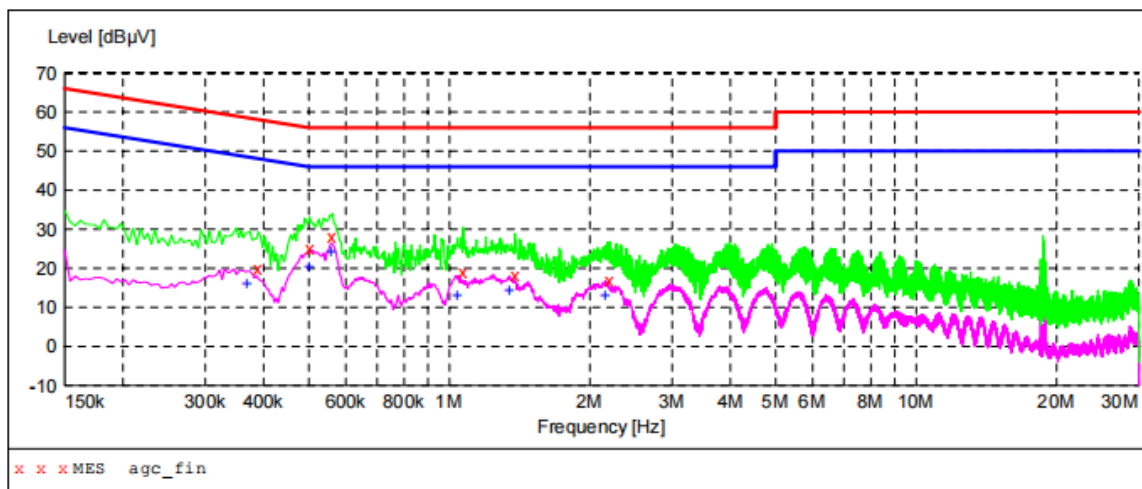
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# LINE CONDUCTED EMISSION TEST-N



## MEASUREMENT RESULT: "agc\_fin"

2022/5/11 18:39

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.390000	19.90	11.3	58	38.2	QP	N	GND
0.502000	25.10	11.3	56	30.9	QP	N	GND
0.562000	28.00	11.3	56	28.0	QP	N	GND
1.070000	19.00	11.3	56	37.0	QP	N	GND
1.382000	18.40	11.3	56	37.6	QP	N	GND
2.206000	16.90	11.3	56	39.1	QP	N	GND

## MEASUREMENT RESULT: "agc\_fin2"

2022/5/11 18:39

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.370000	16.10	11.3	49	32.4	AV	N	GND
0.502000	20.20	11.3	46	25.8	AV	N	GND
0.558000	24.30	11.3	46	21.7	AV	N	GND
1.038000	13.20	11.3	46	32.8	AV	N	GND
1.346000	14.30	11.3	46	31.7	AV	N	GND
2.158000	12.80	11.3	46	33.2	AV	N	GND

**RESULT: PASS**

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## **APPENDIX A: PHOTOGRAPHS OF TEST SETUP**

Refer to the Report No.: AGC01741220406AP01

## **APPENDIX B: PHOTOGRAPHS OF EUT**

Refer to the Report No.: AGC01741220406AP02

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

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3. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.
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