

# Suzhou Pineapple Health Technology Co., Ltd.

## TEST REPORT

### SCOPE OF WORK:

FCC Part 15 subpart B – EMC report

### Model:

BOOSTER MINI

### REPORT NUMBER

200500779SHA-002

### ISSUE DATE

June 10, 2020

### DOCUMENT CONTROL NUMBER

TTRFFCCPART15b\_V1

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Report no. 200500779SHA-002

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**Manufacturer** : Same as applicant

**Manufacturing site** : Same as applicant

#### Summary

The equipment complies with the requirements according to the following standard(s) or Specification:

**47CFR Part 15 (2019):** Radio Frequency Devices (Subpart B)

**ANSI C63.4 (2014):** American National Standard for Methods of Measurement of Radio-Noise  
Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

**PREPARED BY:**

**REVIEWED BY:**



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Project Engineer



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Reviewer

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### Revision History

Report No.	Version	Description	Issued Date
200500779SHA-002	Rev. 01	Initial issue of report	June 10, 2020

## Measurement result summary

TEST ITEM	FCC REFERENCE	TEST RESULT	NOTE
Conducted emission	15.107	Pass	
Radiation emission	15.109	Pass	

Notes: 1: NA =Not Applicable

2. Determination of the test conclusion is based on IEC Guide 115 in consideration of measurement uncertainty.

3: Additions, Deviations and Exclusions from Standards: None.

## 1 GENERAL INFORMATION

### 1.1 Description of Equipment Under Test (EUT)

Product Name : MESSAGE GUN  
Type/Model : BOOSTER MINI  
Description of EUT : We tested it, and listed the worst data.  
Rating : Rated speed: 900-3200rpm  
Rated input: Type-C, DC5V-2.1A  
Rated output: 12V,6.5A  
Battery Capacity: 2500mAh  
Stroke: 6mm  
Maximum power: 70W  
Brand name : Booster boluojun  
Category of EUT : Class B  
EUT type : ☒ Table top  
☐ Floor standing  
Sample received date : May 20, 2020  
Sample identification No. : --  
Date of test : May 20, 2020

## 1.2 Description of Test Facility

Name : Intertek Testing Services Shanghai  
Address : Building 86, No. 1198 Qinzhou Road(North), Shanghai 200233, P.R.  
China  
Telephone : 86 21 61278200  
Telefax : 86 21 54262353

The test facility is : CNAS Accreditation Lab  
recognized, certified, Registration No. CNAS L0139  
or accredited by these FCC Accredited Lab  
organizations Designation Number: CN1175  
IC Registration Lab  
CAB identifier.: CN0051  
VCCI Registration Lab  
Registration No.: R-14243, G-10845, C-14723, T-12252  
A2LA Accreditation Lab  
Certificate Number: 3309.02

## 2 TEST SPECIFICATIONS

### 2.1 Standards or specification

**47CFR Part 15 (2019):** Radio Frequency Device: Subpart B

**ANSI C63.4 (2014):** Interim Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40GHz.

### 2.2 Mode of operation during the test

Within this test report, EUT was tested under all available operation modes and tested under its rating voltage and frequency. Other voltage and frequency is specified if used.

### 2.3 Test software list

Test Items	Software	Manufacturer	Version
Conducted emission	ESxS-K1	R&S	V2.1.0
Radiated emission	ES-K1	R&S	V1.71

### 2.4 Test peripherals list

Item No.	Name	Band and Model	Description
	Adapter	CD112	

### 2.5 Record of climatic conditions

Test Item	Temperature (°C)	Relative Humidity (%)	Pressure (Kpa)
Conducted emission	24	42	101
Radiated Emission	24	42	101

Notes: NA =Not Applicable



## 2.6 Instrument list

Conducted Emission / Disturbance Power / Tri-loop Test / CDN method					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	Test Receiver	R&S	ESCS 30	EC 2107	2020-07-15
<input checked="" type="checkbox"/>	A.M.N.	R&S	ESH2-Z5	EC 3119	2020-12-07
<input checked="" type="checkbox"/>	Shielded room	Zhongyu	-	EC 2838	2021-01-07
Radiated Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	Test Receiver	R&S	ESIB 26	EC 3045	2020-09-11
<input checked="" type="checkbox"/>	Bilog Antenna	TESEQ	CBL 6112D	EC 4206	2021-06-10
<input checked="" type="checkbox"/>	Semi-anechoic chamber	Albatross project	-	EC 3048	2020-07-31
Additional instrument					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3326	2021-03-28
<input checked="" type="checkbox"/>	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3783	2021-02-28
<input checked="" type="checkbox"/>	Pressure meter	YM3	Shanghai Mengde	EC 3320	2020-07-01

## 2.7 Measurement Uncertainty

Measurement	Frequency	Expanded Uncertainty (k=2) ( $\pm$ )
Conducted emission at mains ports	9kHz ~ 150kHz	3.71 dB
	150kHz ~ 30MHz	3.31 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.04 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	4.97 dB
	6GHz ~ 18GHz	5.29 dB

### 3 Conducted emission

Test result: **PASS**

#### 3.1 Limits


##### 3.1.1 Limits for conducted emission of class A device

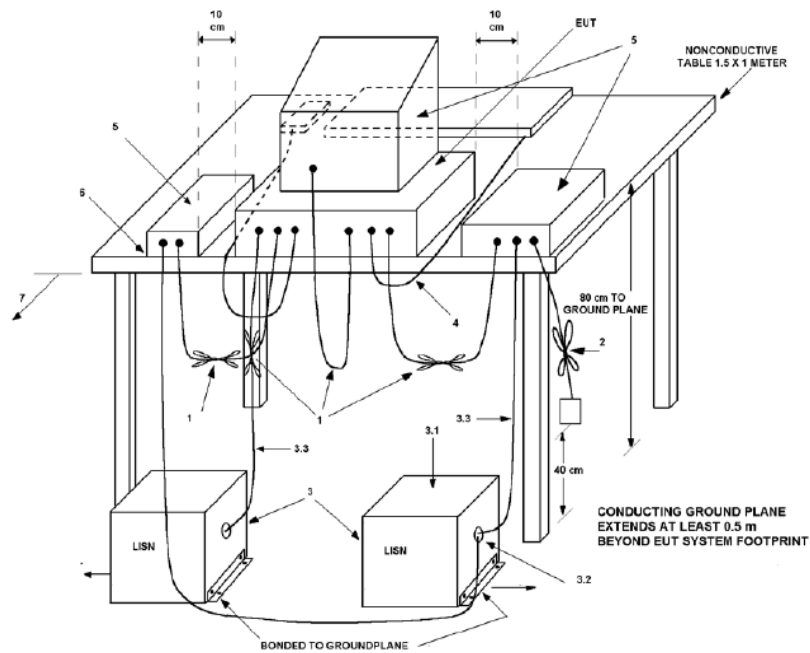
Frequency range (MHz)	Limits dB(μV)	
	Quasi-peak	Average
0.15 ~ 0.5	79	66
0.5 ~ 30	73	60
Note: If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.		

##### 3.1.2 Limits for conducted emission of class B device

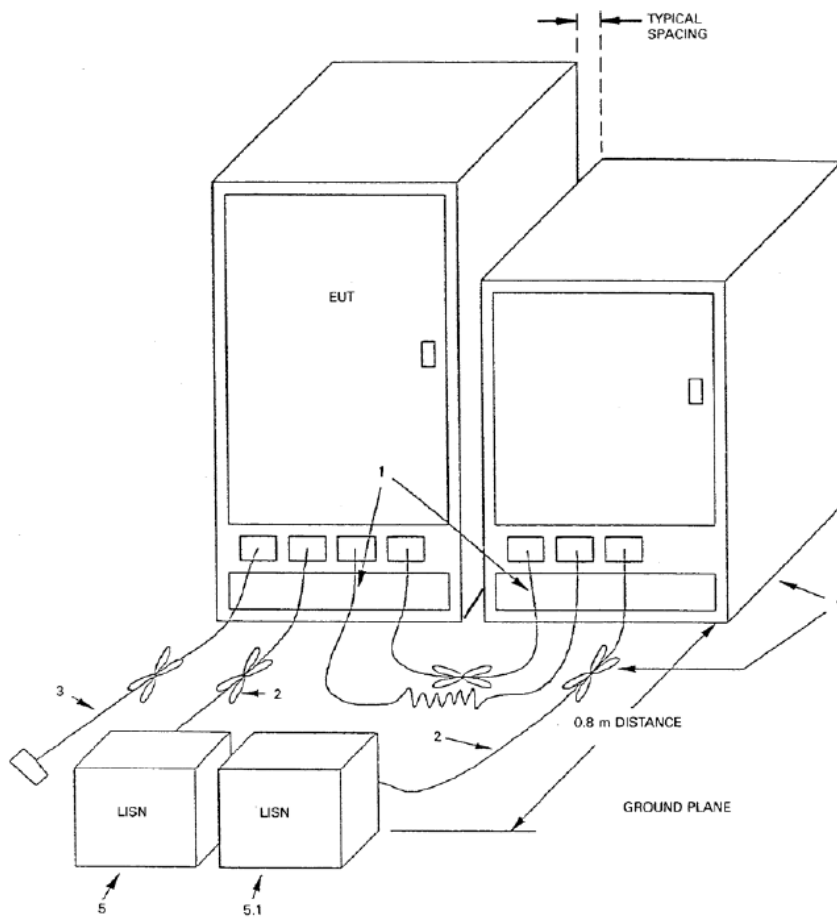
Frequency range (MHz)	Limits dB(μV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 ~ 56 *	56 ~ 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50
Note: 1. * Means the limit decreasing linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz 2. If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.		

### 3.2 Test setup

 For table top equipment



☐ For floor standing equipment



### **3.3 Test Setup and Test Procedure**

Measurement was performed in shielded room, and instruments used were following clause 4 and clause 5 of ANSI 63.4.

Detailed test procedure was following clause 7.3 of ANSI 63.4.

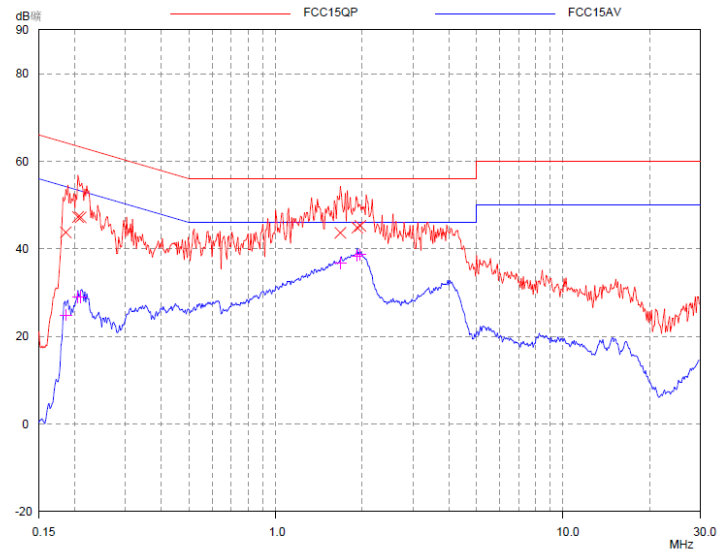
EUT arrangement and operation conditions were according to clause 6 and clause 7 of ANSI 63.4.

Frequency range 150kHz – 30MHz was checked and EMI receiver measurement bandwidth was set to 9 kHz.

### 3.4 Test Protocol

Charging mode

L line:

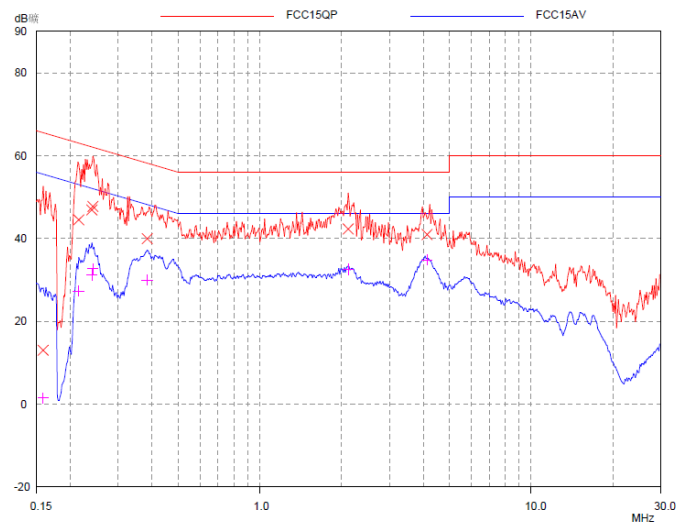


#### Final Measurement Results

Frequency MHz	QP Level dBm	QP Limit dBm	QP Delta dB
0.186	43.75	64.21	20.46
0.20466	47.27	63.42	16.15
0.20962	47.19	63.22	16.03
1.67738	43.65	56.00	12.35
1.9207	44.85	56.00	11.15
1.96717	45.25	56.00	10.75

Frequency MHz	AV Level dBm	AV Limit dBm	AV Delta dB
0.186	24.92	54.21	29.29
0.20466	28.93	53.42	24.49
0.20962	29.01	53.22	24.21
1.67738	36.72	46.00	9.28
1.9207	38.38	46.00	7.62
1.96717	38.66	46.00	7.34

N line:



Final Measurement Results

Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB
0.1586	13.04	65.54	52.50
0.21469	44.51	63.02	18.51
0.24002	46.91	62.10	15.19
0.24194	47.75	62.03	14.28
0.38409	39.97	58.19	18.22
2.11343	42.30	56.00	13.70
4.12736	40.96	56.00	15.04

Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB
0.1586	1.46	55.54	54.08
0.21469	27.33	53.02	25.69
0.24002	31.26	52.10	20.84
0.24194	32.67	52.03	19.36
0.38409	29.99	48.19	18.20
2.11343	32.58	46.00	13.42
4.12736	34.85	46.00	11.15

- Remark: 1. Correct Factor = LISN Factor + Cable Loss, the value was added to Original Receiver Reading by the software automatically.  
 2. Corrected Reading = Original Receiver Reading + Correct Factor  
 3. Margin = Limit - Corrected Reading  
 4. If the PK Corrected Reading is lower than AV limit, the AV test can be elided.

Example: Assuming LISN Factor = 10.00dB, Cable Loss = 2.00dB,  
 Original Receiver Reading = 10.00dBuV, Limit = 66.00dBuV.  
 Then Correct Factor = 10.00 + 2.00 = 12.00dB;  
 Corrected Reading = 10dBuV + 12.00dB = 22.00dBuV;  
 Margin = 66.00dBuV – 22.00dBuV = 44.00dB.

## 4 Radiated emission

Test result: **PASS**

### 4.1 Radiated emission limits

#### 4.1.1 Limits for radiated emission of class A device


Frequency (MHz)	Permitted limit in dB $\mu$ V/m (Quasi-peak) of Measurement Distance 10m
30 ~ 88	39
88 ~ 216	43.5
216 ~ 960	46.4
Above 960	49.5
Note: for the measurement distance other than 3m and 10m, the limit is varied according to 20dB/10 decades.	

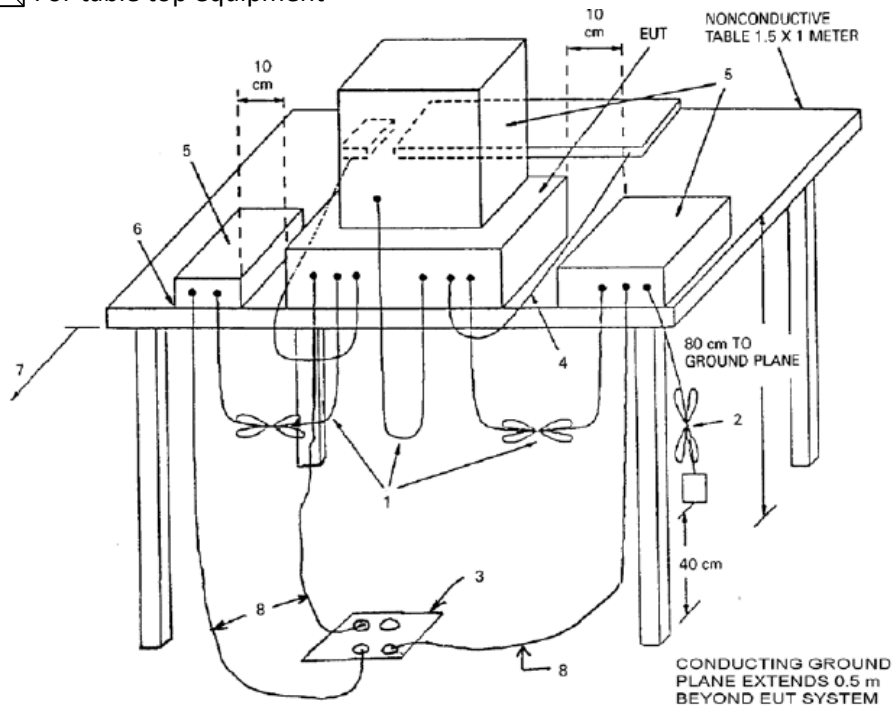
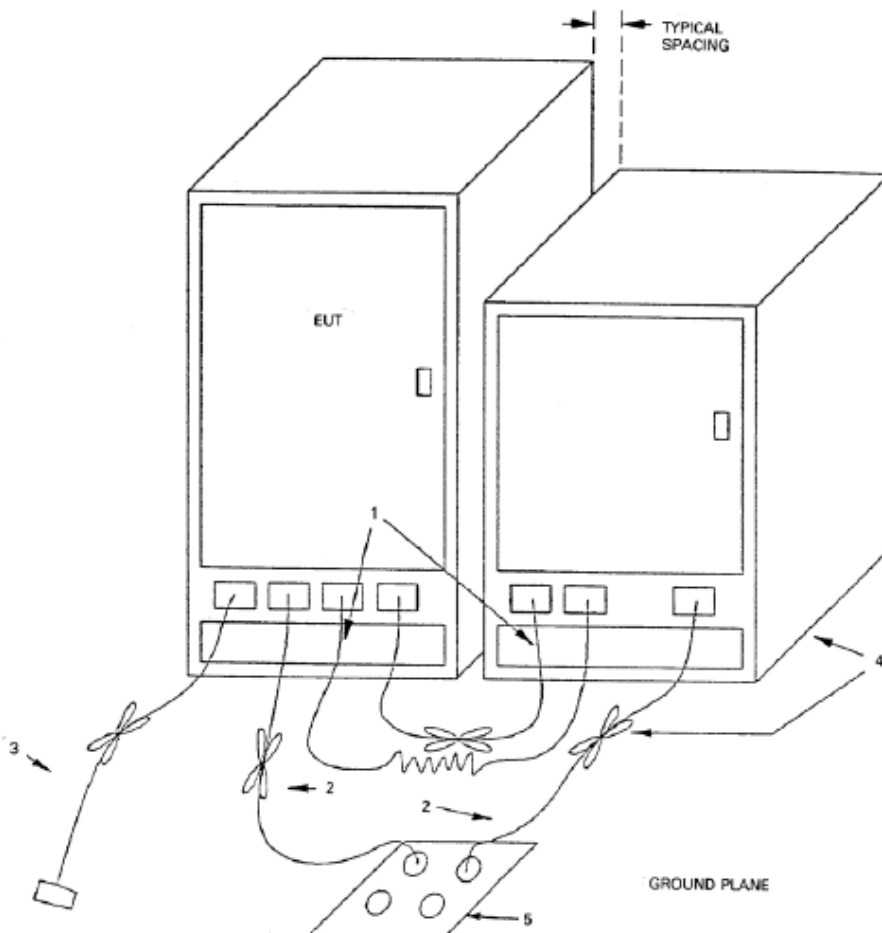
#### 4.1.2 Limits for radiated emission of class B device

Frequency (MHz)	Permitted limit in dB $\mu$ V/m (Quasi-peak) of Measurement Distance 3m
30 ~ 88	40.0
88 ~ 216	43.5
216 ~ 960	46.0
Above 960	54.0
Note: for the measurement distance other than 3m and 10m, the limit is varied according to 20dB/10 decades.	



## 4.2 Block diagram and test set up

 For table top equipment

☐ For floor standing equipment

### **4.3 Test Setup and Test Procedure**

The measurement was performed in a semi-anechoic chamber.

The distance from EUT to receiving antenna is 3 meter.

Measurement was performed according to clause 4 and clause 5 of ANSI 63.4.

Test procedure was according to clause 8.3 of ANSI 63.4.

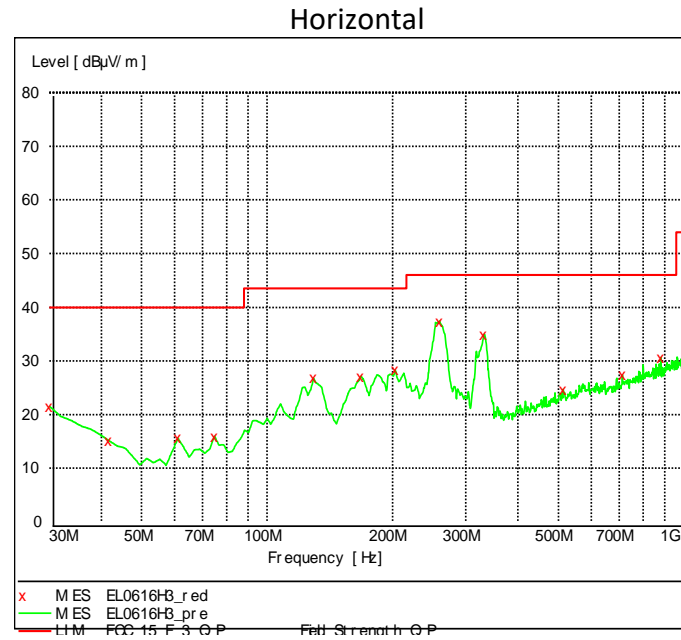
EUT arrangement and operate condition were according to clause 6 and clause 8 of ANSI 63.4.

The bandwidth setting on R&S Test Receiver was 120 kHz.

The required measurement frequency range was checked.

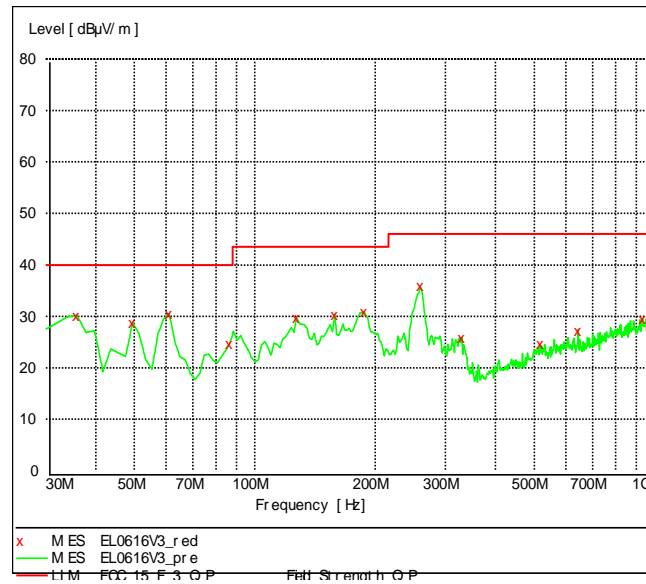
#### 4.4 Test Protocol

**Test Curve:**  
Charging mode



Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB
30.000000	21.50	19.4	40.0	18.5
41.663327	15.10	12.8	40.0	24.9
61.102204	15.60	7.3	40.0	24.4
74.709419	15.90	7.8	40.0	24.1
129.138277	26.80	12.9	43.5	16.7
168.016032	27.10	10.9	43.5	16.4
203.006012	28.30	10.9	43.5	15.2
259.378758	37.40	14.9	46.0	8.6
331.302605	34.90	15.7	46.0	11.1
514.028056	24.70	19.8	46.0	21.3
712.304609	27.40	21.7	46.0	18.6
881.422846	30.60	23.5	46.0	15.4

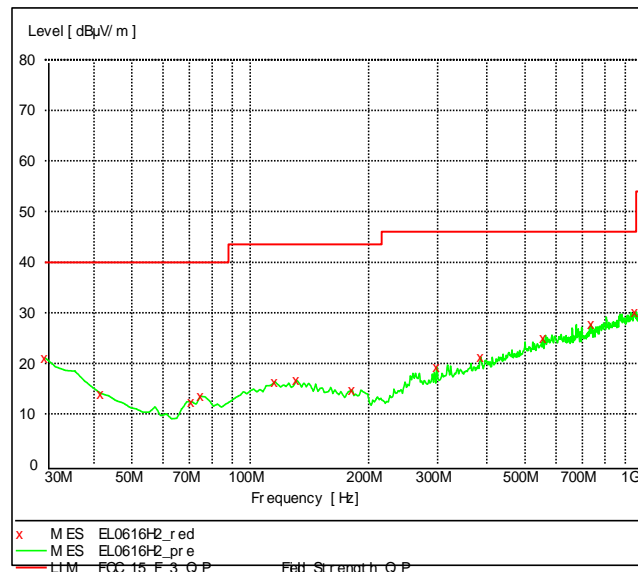
### Vertical



Frequency	Level	Transd	Limit	Margin
MHz	<u>dBuV/m</u>	<u>dB</u>	<u>dBuV/m</u>	<u>dB</u>
35.831663	30.20	15.9	40.0	9.8
49.438878	28.80	9.2	40.0	11.2
61.102204	30.50	7.3	40.0	9.5
86.372745	24.60	9.2	40.0	15.4
127.194389	29.70	13.0	43.5	13.8
158.296593	30.40	11.3	43.5	13.1
187.454910	30.90	10.7	43.5	12.6
259.378758	35.80	14.9	46.0	10.2
329.358717	25.90	15.6	46.0	20.1
517.915832	24.60	19.8	46.0	21.4
644.268537	27.10	21.2	46.0	18.9
933.907816	29.60	23.9	46.0	16.4

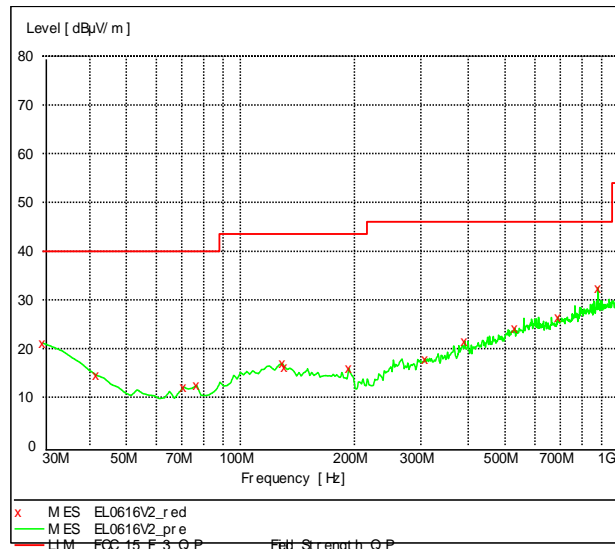
## Discharging mode

### Horizontal



Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB
30.000000	21.10	19.4	40.0	18.9
41.663327	14.00	12.8	40.0	26.0
70.821643	12.40	7.6	40.0	27.6
74.709419	13.50	7.8	40.0	26.5
115.531062	16.30	13.0	43.5	27.2
131.082164	16.60	12.9	43.5	26.9
181.623246	14.70	10.6	43.5	28.8
298.256513	19.30	14.7	46.0	26.7
385.731463	21.20	17.2	46.0	24.8
556.793587	25.00	20.4	46.0	21.0
737.575150	27.70	22.0	46.0	18.3
951.402806	30.10	24.1	46.0	15.9

### Vertical



Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB
30.000000	21.10	19.4	40.0	18.9
41.663327	14.50	12.8	40.0	25.5
70.821643	12.10	7.6	40.0	27.9
76.653307	12.40	7.8	40.0	27.6
129.138277	16.90	12.9	43.5	26.6
131.082164	16.10	12.9	43.5	27.4
193.286573	15.90	10.8	43.5	27.6
307.975952	17.90	15.0	46.0	28.1
391.563126	21.50	17.3	46.0	24.5
531.523046	24.20	20.0	46.0	21.8
690.921844	26.50	21.5	46.0	19.5
881.422846	32.50	23.5	46.0	13.5

Remark: 1. Correct Factor = Antenna Factor + Cable Loss (+ Amplifier, for higher than 1GHz)

2. Corrected Reading = Original Receiver Reading + Correct Factor

3. Margin = Limit - Corrected Reading

4. If the PK Corrected Reading is lower than AV limit, the AV test can be elided.

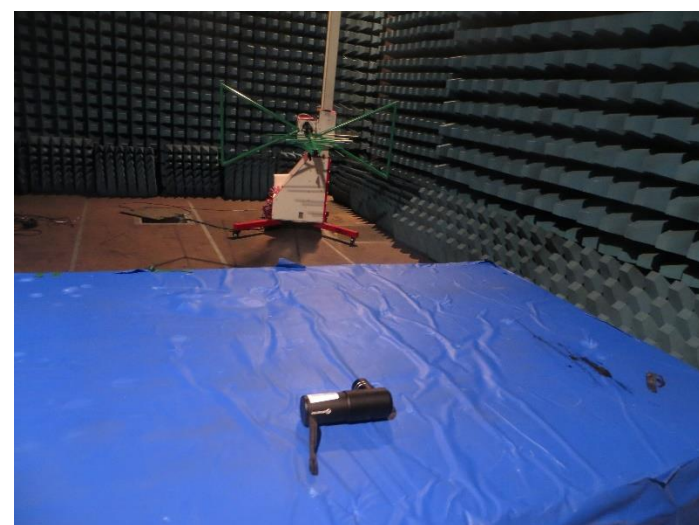
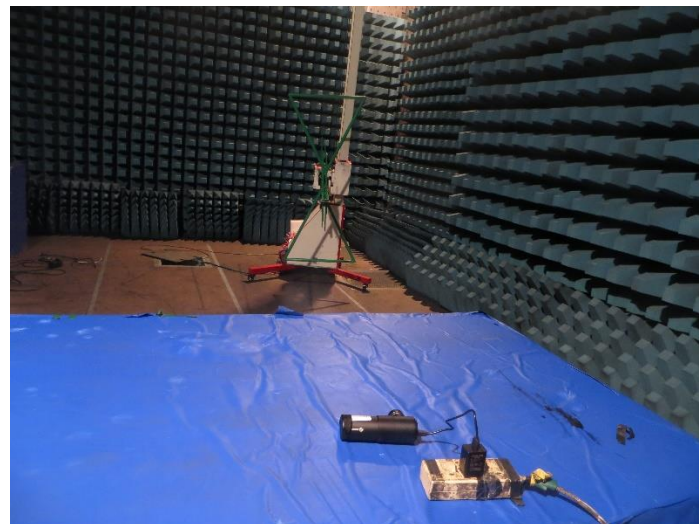
Example: Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB,

Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10.00dBuV, limit = 40.00dBuV/m.

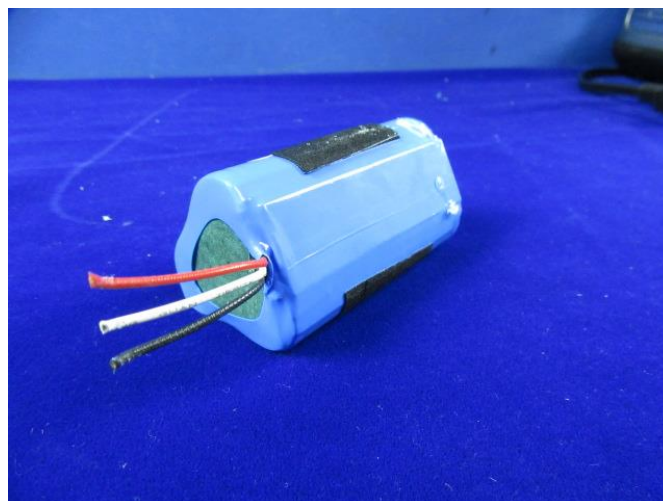
Then Correct Factor = 30.20 + 2.00 – 32.00 = 0.20dB/m; Corrected Reading = 10dBuV +

0.20dB/m = 10.20dBuV/m; Margin = 40.00dBuV/m - 10.20dBuV/m = 29.80dB.

## Appendix I: Photograph of Test setup



## Appendix II: Photograph of equipment under test



**\*\*\*END of the report\*\*\***