FCC PART 15B

TEST REPORT

For

MPOW TECHNOLOGY CO.,LIMITED

FLAT/RM 605 6/F FA YUEN COMMERCIAL BUILDING 75-77 FA YUEN STREET
MONGKOK KL HONG KONG

Test Model: BH476A

Report Type:	**Product Type:**
Original Report	MPOW M13 TRUE WIRELESS EARBUDS

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Report Number:	DG2210429-14600E-00B
Report Date:	2021-05-21
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:	MPOW M13 TRUE WIRELESS EARBUDS
EUT Model:	BH476A
Highest Operation Frequency:	2480 MHz
Rated Input Voltage:	DC 3.7V from battery
Serial Number:	DG2210429-14600E-RF-S1
EUT Received Date:	2021.04.29
EUT Received Status:	Good

Objective

This report is prepared on behalf of ***MPOW TECHNOLOGY CO.,LIMITED*** in accordance with FCC Part 15B Part 2, Part J, and Part 15, Subpart A and B of the Federal Communications Commission's rules..

The objective is to determine the compliance of EUT with: FCC Part 15B.

Test Methodology

All measurements contained in this report were conducted with 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.

Measurement Uncertainty

Parameter	Measurement Uncertainty
Unwanted Emissions, radiated	30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical 1G~6GHz: 4.45 dB, 6G~13GHz: 5.23 dB
Temperature	±1℃
Humidity	±5%
AC Power Lines Conducted Emission	3.12 dB (150 kHz to 30 MHz)

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218, the FCC Designation No. : CN1220.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0022.

Declarations

BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol "▲". Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in Charging mode.

Equipment Modifications

No modification was made to the EUT.

EUT Exercise Software

No software was used during test.

Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Dongguan Aohai Technology Co.,Ltd	adapter	A138A-120150U-US2	AH2002105372
Vietnam Honor High Tech Company Limited	adapter	ADS-10LA-06 050 10EPCU	000051

Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
USB Cable	yes	No	0.8	USB Port of adapter	EUT

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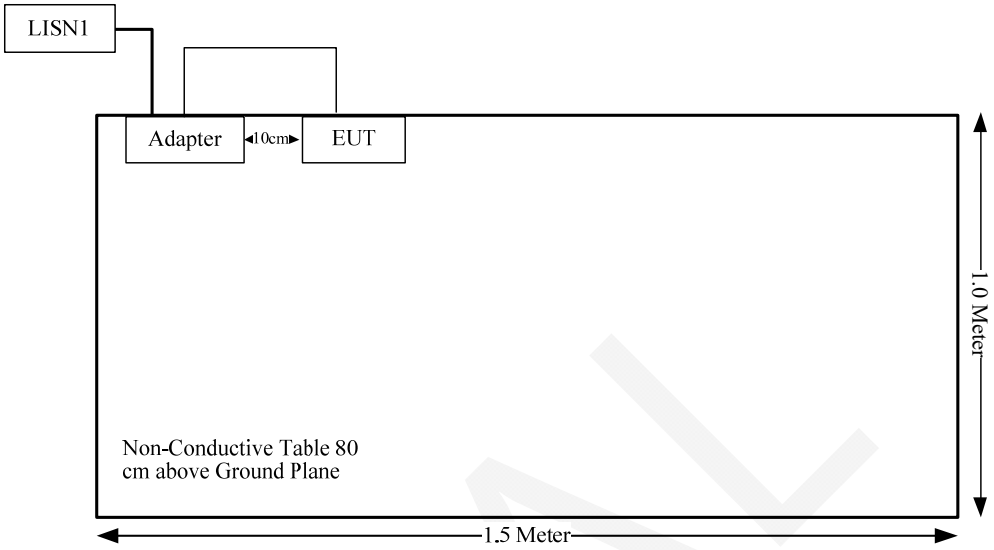
Block Diagram of Test Setup



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Test Equipment List

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted emissions					
R&S	LISN	ENV 216	101614	2020-09-12	2021-09-12
R&S	EMI Test Receiver	ESCI	101121	2020-07-07	2021-07-07
MICRO-COAX	Coaxial Cable	C-NJNJ-50	C-0200-01	2020-09-05	2021-09-05
R&S	Test Software	EMC32	Version 9.10.00	N/A	N/A
Radiated emissions Below 1GHz					
Sunol Sciences	Antenna	JB3	A060611-2	2020-08-25	2023-08-25
R&S	EMI Test Receiver	ESCI	100224	2020-09-12	2021-09-12
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-02	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0530-01	2020-09-24	2021-09-24
Sonoma	Amplifier	310N	185914	2020-10-13	2021-10-13
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
Radiated emissions above 1 GHz					
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Agilent	Spectrum Analyzer	E4440A	SG43360054	2020-07-07	2021-07-07
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2020-09-05	2021-09-05
Mini-Circuit	Amplifier	ZVA-213-S+	54201245	2020-09-05	2021-09-05
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
E-Microwave	Band-stop Filters	OBSF-2400-2483.5-S	OE01601525	2020-06-16	2021-06-16

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Environmental Conditions

Test Item:	Conducted emissions	Radiated emissions (Below 1GHz)	Radiated emissions (above1GHz)
Temperature:	25.2°C	21.4°C	27.7°C
Relative Humidity:	63%	53%	53%
ATM Pressure:	100.4kPa	100.7kPa	100.3kPa
Tester:	Walker Chen	Carlos Nie	Lee Li
Test Date:	2021-05-18	2021-05-11	2021-05-13

SUMARY OF TEST RESULTS

FCC Part 15B

Clause	Description of Test	Test Result
§15.107	Conducted emissions	Compliance
§15.109	Radiated emissions	Compliance

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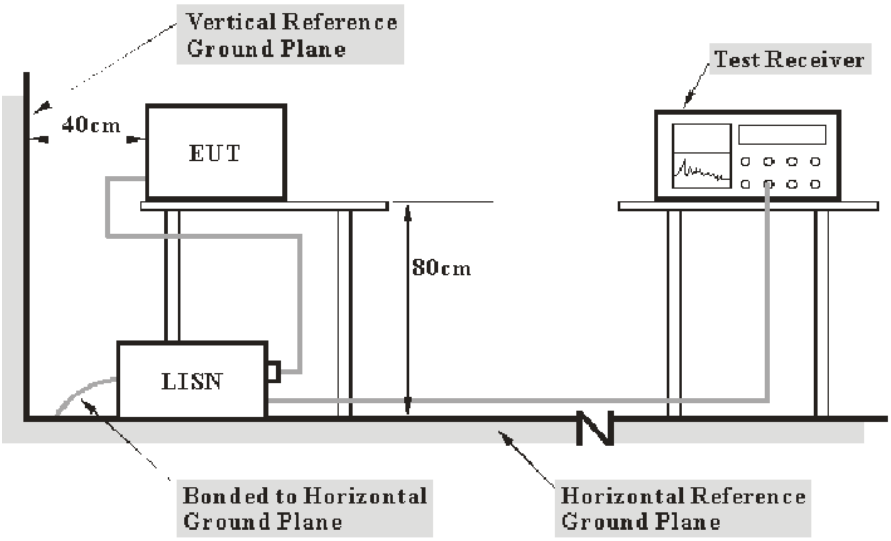
CONDUCTED EMISSIONS

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 15 B Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the first LISN and the other support equipments were connected to the outlet of the second LISN.

The frequency and amplitude of the six highest ac power-line conducted emissions relative to the limit, measured over all the current-carrying conductors of the EUT power cords, and the operating frequency or frequency to which the EUT is tuned (if appropriate), should be reported, unless such emissions are more than 20 dB below the limit. AC power-line conducted emissions measurements are to be separately carried out only on each of the phase ("hot") line(s) and (if used) on the neutral line(s), but not on the ground [protective earth] line(s). If less than six emission frequencies are within 20 dB of the limit, then the noise level of the measuring instrument at representative frequencies should be reported. The specific conductor of the power-line cord for each of the reported emissions should be identified. Measure the six highest emissions with respect to the limit on each current-carrying conductor of each power cord associated with the EUT (but not the power cords of associated or peripheral equipment that are part of the test configuration). Then, report the six highest emissions with respect to the limit from among all the measurements identifying the frequency and specific current-carrying conductor identified with the emission. The six highest emissions should be reported for each of the current-carrying conductors, or the six highest emissions may be reported over all the current-carrying conductors.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result (QuasiPeak or Average) = Meter Reading + Corr.

Note:
Corr. = Cable loss + Factor of coupling device

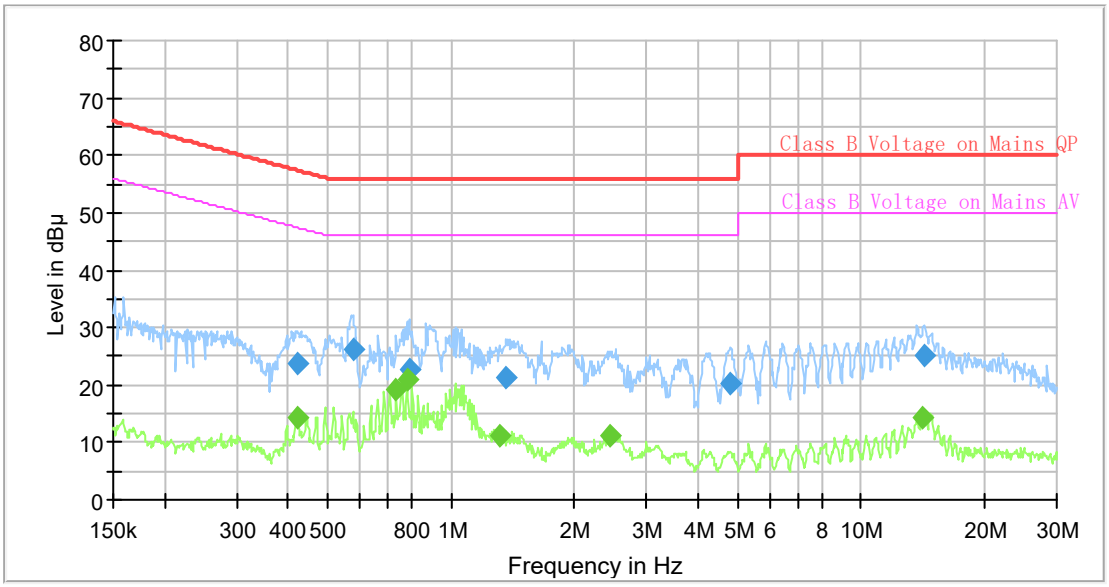
The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the maximum limit. The equation for margin calculation is as follows:

Margin = Limit – Result

Test Data

Please refer to following table and plots:

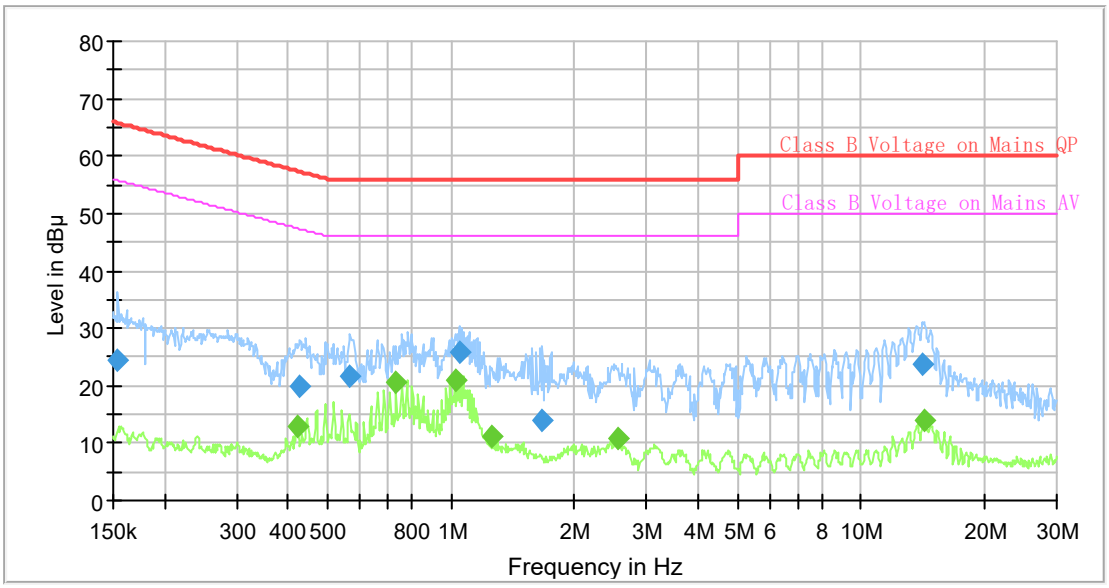
Port:	L
Test Mode:	Charging
Power Source:	AC 120V/60Hz
Note:	



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.421178	---	14.22	47.42	33.20	9.000	L1	9.6
0.421178	23.85	---	57.42	33.57	9.000	L1	9.6
0.576671	26.29	---	56.00	29.71	9.000	L1	9.6
0.732654	---	19.30	46.00	26.70	9.000	L1	9.7
0.781732	---	20.80	46.00	25.20	9.000	L1	9.7
0.789569	22.70	---	56.00	33.30	9.000	L1	9.7
1.313192	---	11.26	46.00	34.74	9.000	L1	9.7
1.359849	21.31	---	56.00	34.69	9.000	L1	9.7
2.449547	---	11.15	46.00	34.85	9.000	L1	9.7
4.802907	20.16	---	56.00	35.84	9.000	L1	9.7
14.105014	---	14.35	50.00	35.65	9.000	L1	10.1
14.317649	25.13	---	60.00	34.87	9.000	L1	10.2

Port: N
Test Mode: Charging
Power Source: AC 120V/60Hz
Note:



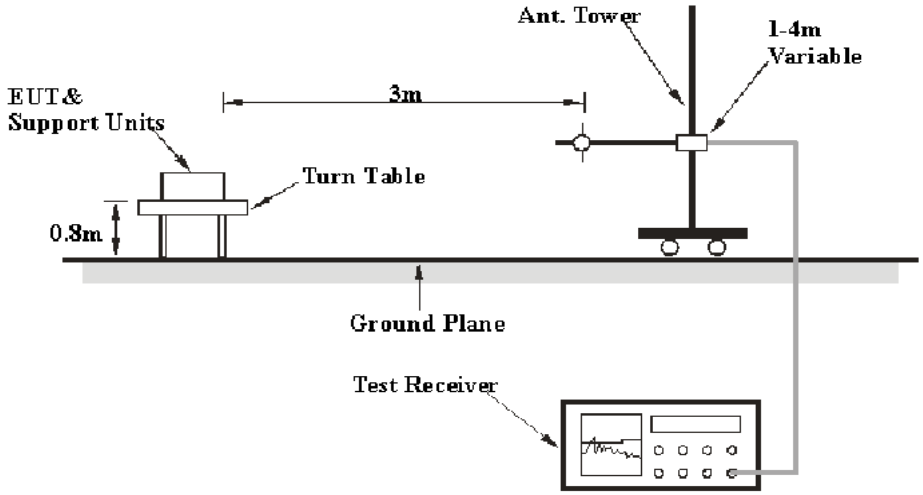
Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.153788	24.31	---	65.79	41.48	9.000	N	9.6
0.421178	---	13.07	47.42	34.35	9.000	N	9.6
0.427528	20.04	---	57.30	37.26	9.000	N	9.6
0.568106	21.66	---	56.00	34.34	9.000	N	9.6
0.732654	---	20.67	46.00	25.33	9.000	N	9.6
1.023352	---	20.94	46.00	25.06	9.000	N	9.6
1.049193	25.99	---	56.00	30.01	9.000	N	9.6
1.261826	---	11.16	46.00	34.84	9.000	N	9.6
1.668396	13.91	---	56.00	42.09	9.000	N	9.6
2.562008	---	10.83	46.00	35.17	9.000	N	9.6
14.105014	23.59	---	60.00	36.41	9.000	N	9.8
14.246417	---	13.95	50.00	36.05	9.000	N	9.9

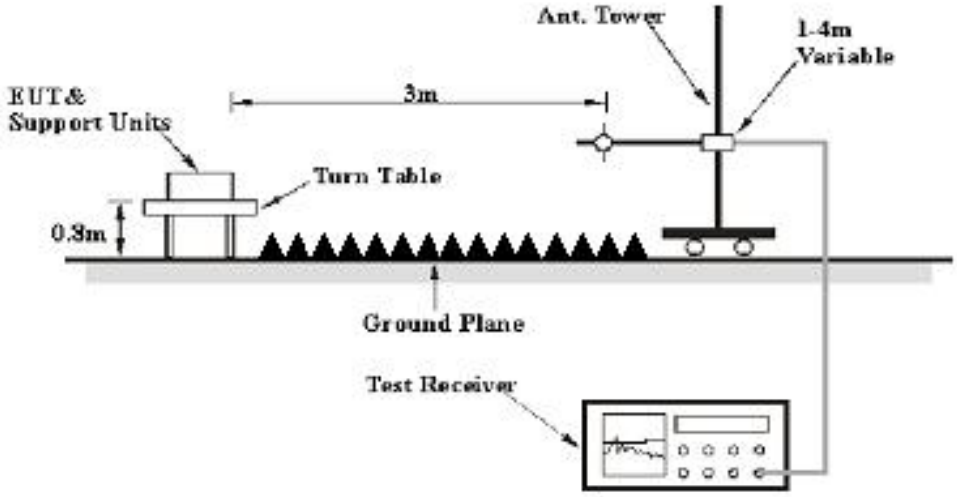
FCC PART 15B §15.109 – RADIATED EMISSIONS

EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission tests were performed at the 10 meters Chamber, above 1GHz were performed at the 3 meters Chamber B, using the setup accordance with the ANSI C63.4-2014. The specification used was the FCC Part 15.109 Class B limits.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 13 GHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	Peak
	1 MHz	Reduced video bandwidth	/	AVG

Test Procedure

During the radiated emissions, the adapter was connected to the first AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The data was recorded in the Quasi-peak detection mode for below 1 GHz, peak and average detection mode above 1 GHz.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result = Meter Reading+ Corrected

Note:
Corrected = Antenna Factor + Cable Loss - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Result

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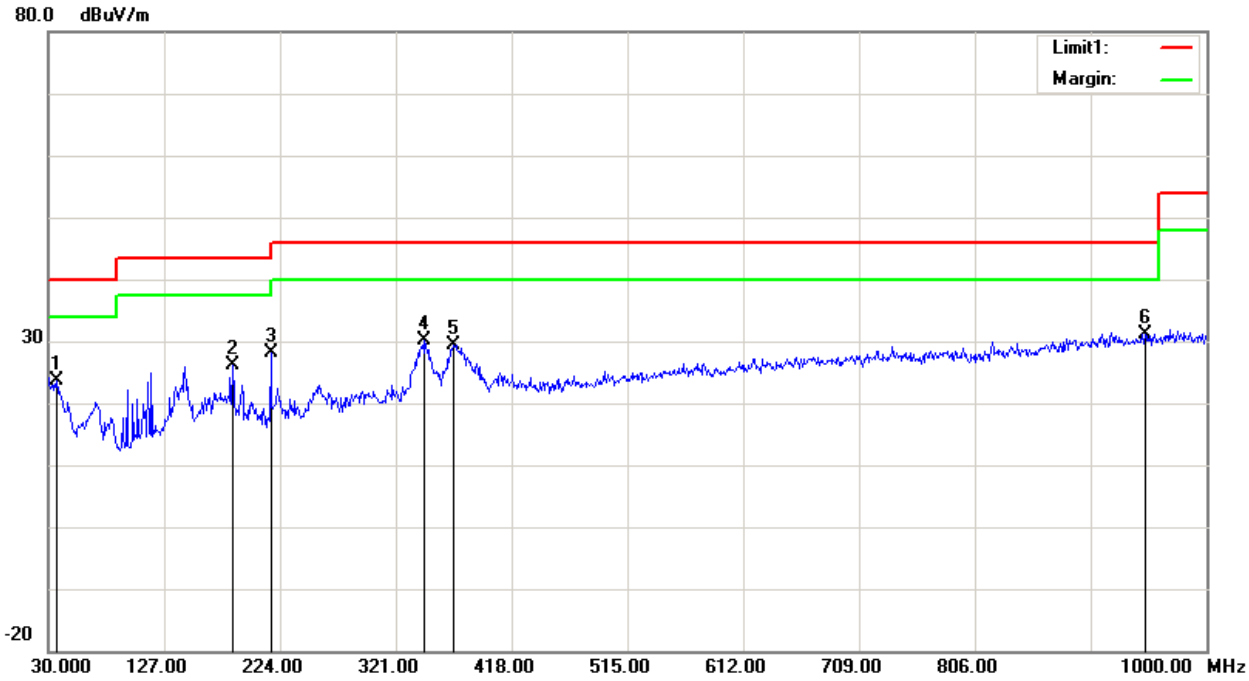
Test Data

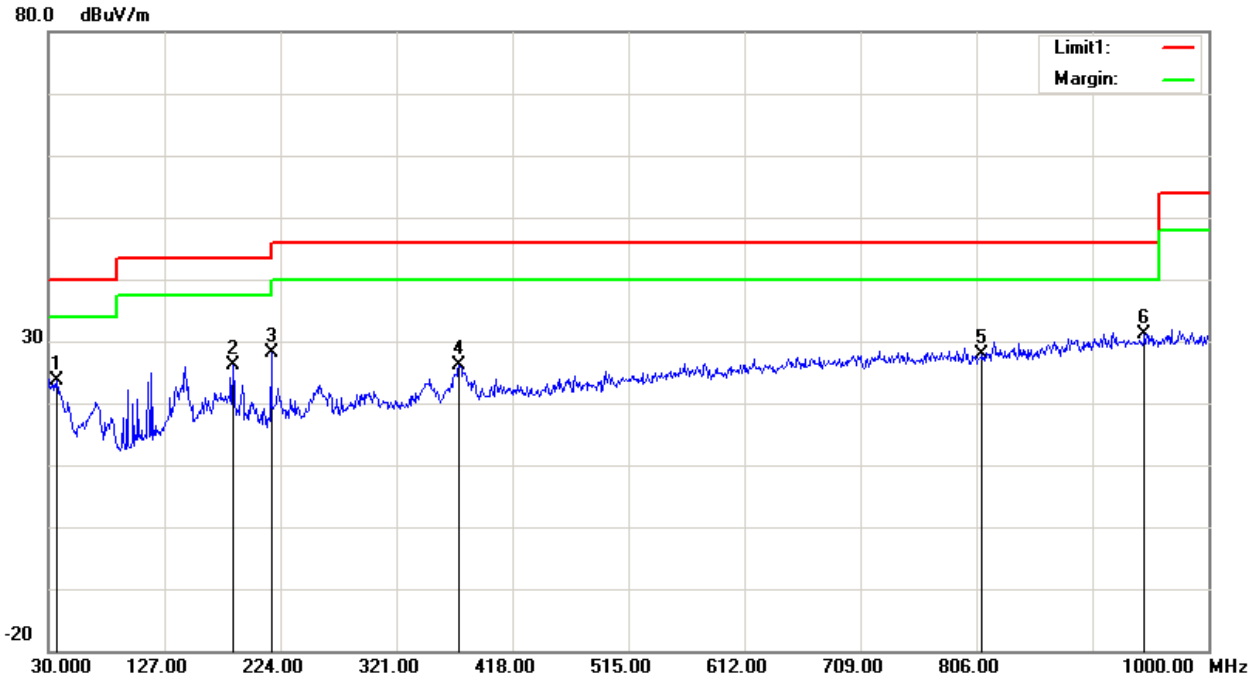
Please refer to following table and plots:

Condition:	**FCC Part 15B Class B**	**Polarization:**	**Horizontal**
Test Mode:	charging	**Distance:**	3m



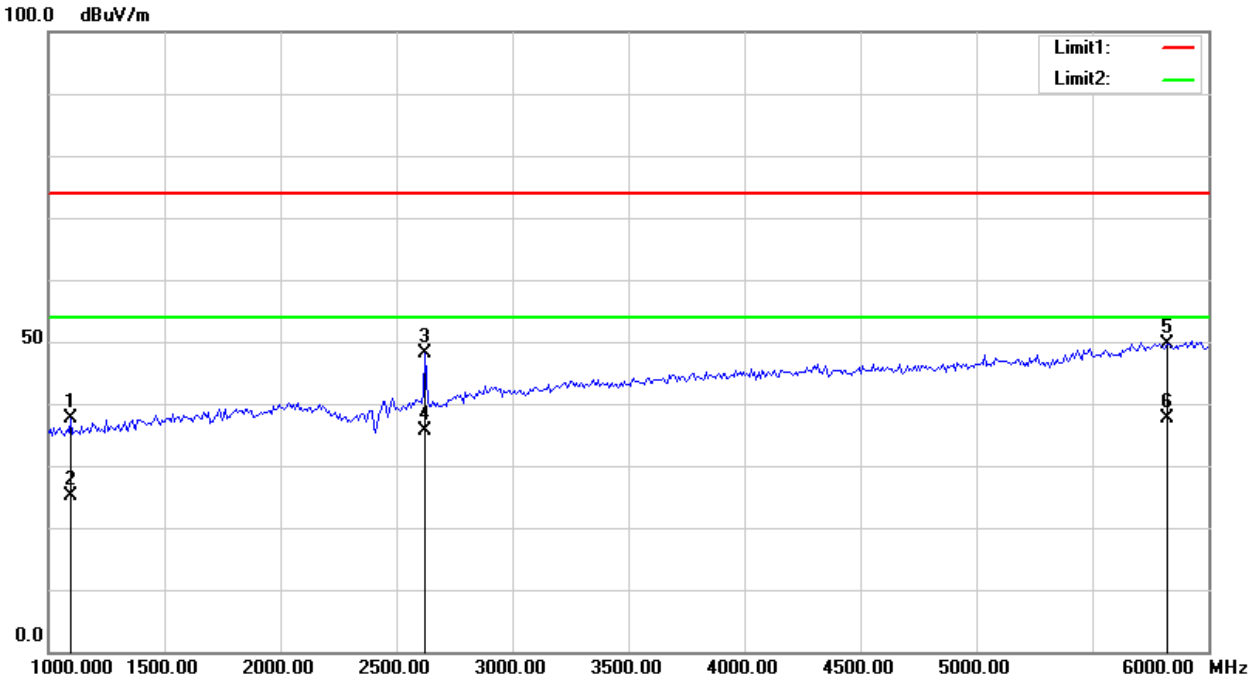
No.	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1	36.7900	31.17	peak	-7.63	23.54	40.00	16.46
2	184.2300	36.13	peak	-10.07	26.06	43.50	17.44
3	216.2400	39.20	peak	-11.17	28.03	46.00	17.97
4	345.2500	36.72	peak	-6.58	30.14	46.00	15.86
5	369.5000	35.44	peak	-5.96	29.48	46.00	16.52
6	948.5900	26.39	peak	4.63	31.02	46.00	14.98

Condition: **FCC Part 15B Class B** **Polarization:** **Vertical**
Test Mode: charging **Distance:** 3m



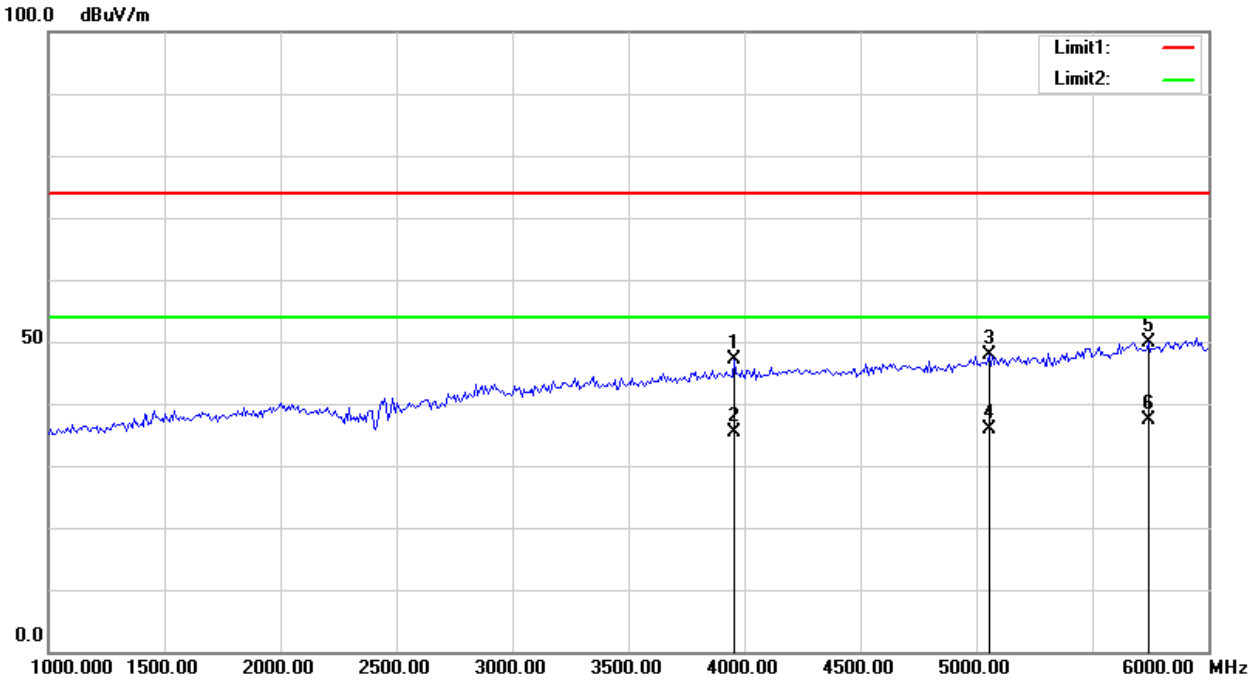
No.	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1	36.7900	31.17	peak	-7.63	23.54	40.00	16.46
2	184.2300	36.13	peak	-10.07	26.06	43.50	17.44
3	216.2400	39.20	peak	-11.17	28.03	46.00	17.97
4	373.3800	32.02	peak	-5.94	26.08	46.00	19.92
5	810.8500	26.81	peak	1.03	27.84	46.00	18.16
6	946.6500	26.60	peak	4.53	31.13	46.00	14.87

Condition: **FCC Part 15B Class B** **Polarization:** **Horizontal**
Test Mode: **Charging** **Distance:** 3m



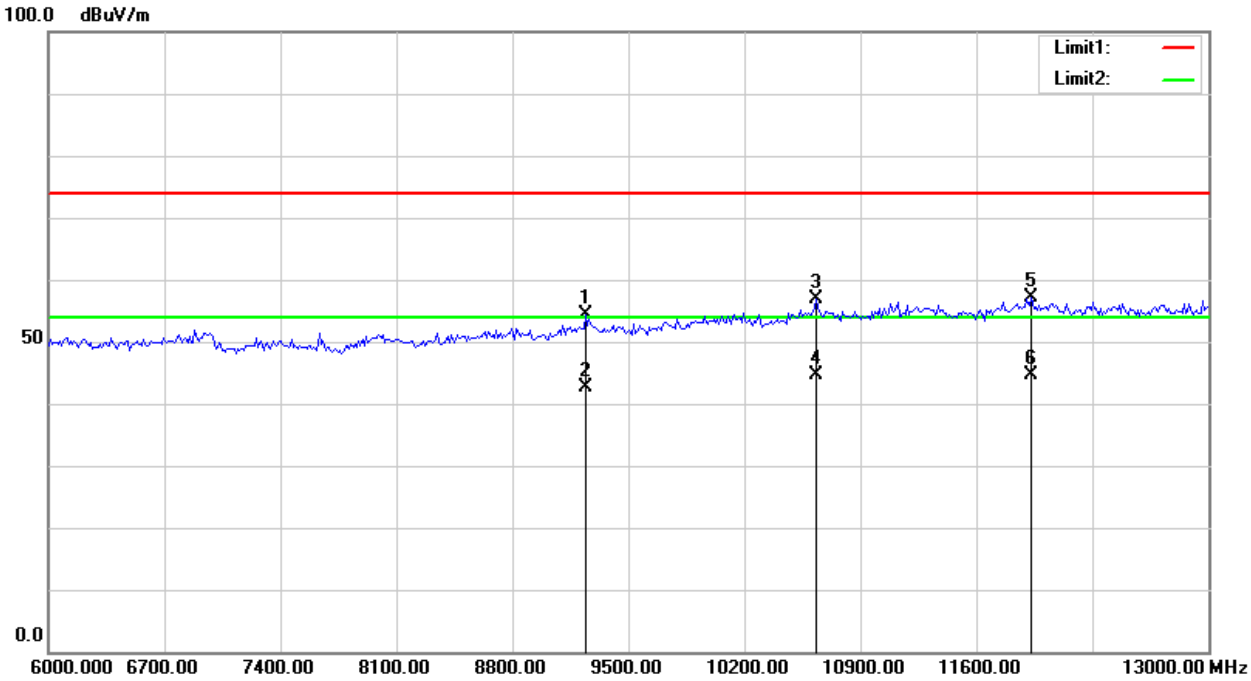
No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	1096.154	38.27	peak	-0.64	37.63	74.00	36.37
2	1096.154	25.87	AVG	-0.64	25.23	54.00	28.77
3	2626.603	43.64	peak	4.47	48.11	74.00	25.89
4	2626.603	31.26	AVG	4.47	35.73	54.00	18.27
5	5823.718	36.14	peak	13.58	49.72	74.00	24.28
6	5823.718	24.16	AVG	13.58	37.74	54.00	16.26

Condition: **FCC Part 15B Class B** **Polarization:** **Vertical**
Test Mode: **Charging** **Distance:** 3m



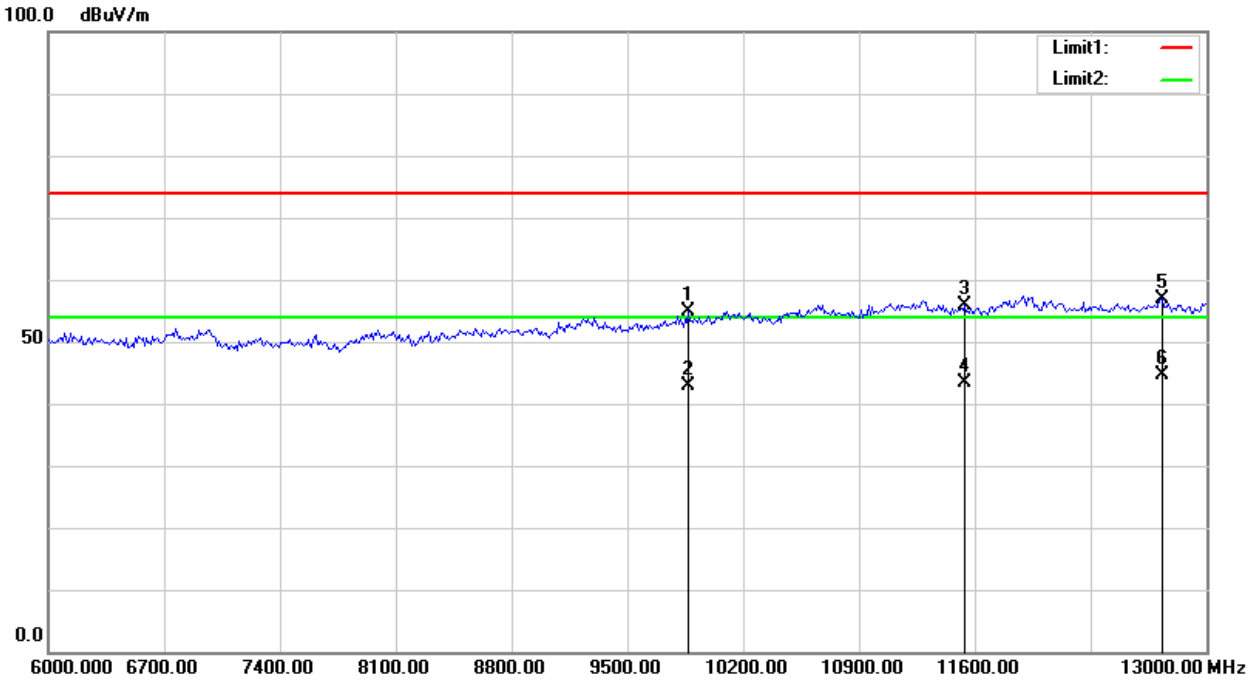
No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	3956.731	38.01	peak	9.06	47.07	74.00	26.93
2	3956.731	26.31	AVG	9.06	35.37	54.00	18.63
3	5054.487	36.78	peak	11.14	47.92	74.00	26.08
4	5054.487	24.75	AVG	11.14	35.89	54.00	18.11
5	5743.590	36.77	peak	13.21	49.98	74.00	24.02
6	5743.590	24.16	AVG	13.21	37.37	54.00	16.63

Condition: **FCC Part 15B Class B** **Polarization:** **Horizontal**
Test Mode: **Charging** **Distance:** 3m



No.	Frequency (MHz)	Reading (dBuV)	Detector	Corrected dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	9241.987	36.59	peak	17.77	54.36	74.00	19.64
2	9241.987	24.78	AVG	17.77	42.55	54.00	11.45
3	10633.013	37.58	peak	19.25	56.83	74.00	17.17
4	10633.013	25.36	AVG	19.25	44.61	54.00	9.39
5	11934.295	36.54	peak	20.52	57.06	74.00	16.94
6	11934.295	24.15	AVG	20.52	44.67	54.00	9.33

Condition: **FCC Part 15B Class B** **Polarization:** **Vertical**
Test Mode: **Charging** **Distance:** 3m

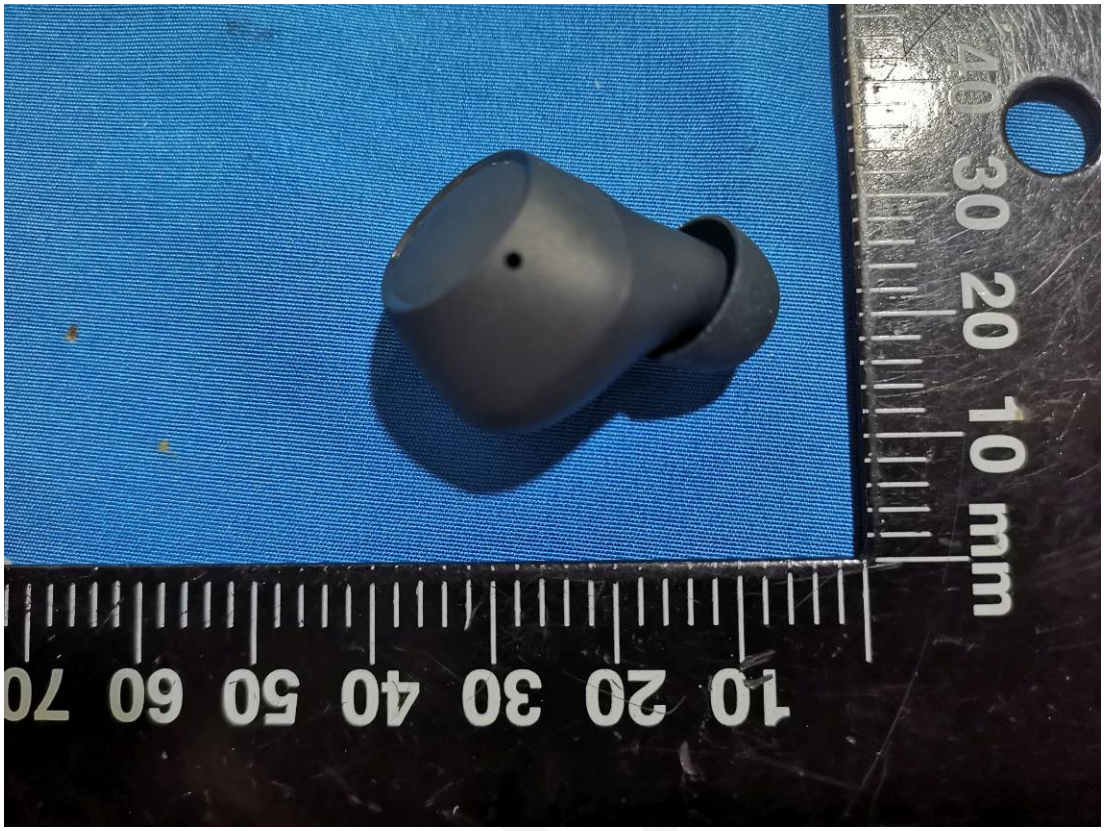


No.	Frequency (MHz)	Reading (dBuV)	Detector	Corrected dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	9870.192	36.17	peak	18.59	54.76	74.00	19.24
2	9870.192	24.17	AVG	18.59	42.76	54.00	11.24
3	11541.667	35.87	peak	20.12	55.99	74.00	18.01
4	11541.667	23.15	AVG	20.12	43.27	54.00	10.73
5	12730.769	35.76	peak	21.04	56.80	74.00	17.20
6	12730.769	23.47	AVG	21.04	44.51	54.00	9.49

EXHIBIT A – EUT PHOTOGRAPHS

10 20 30 40 50 60 70 80
10 mm 20 30 40 50 60

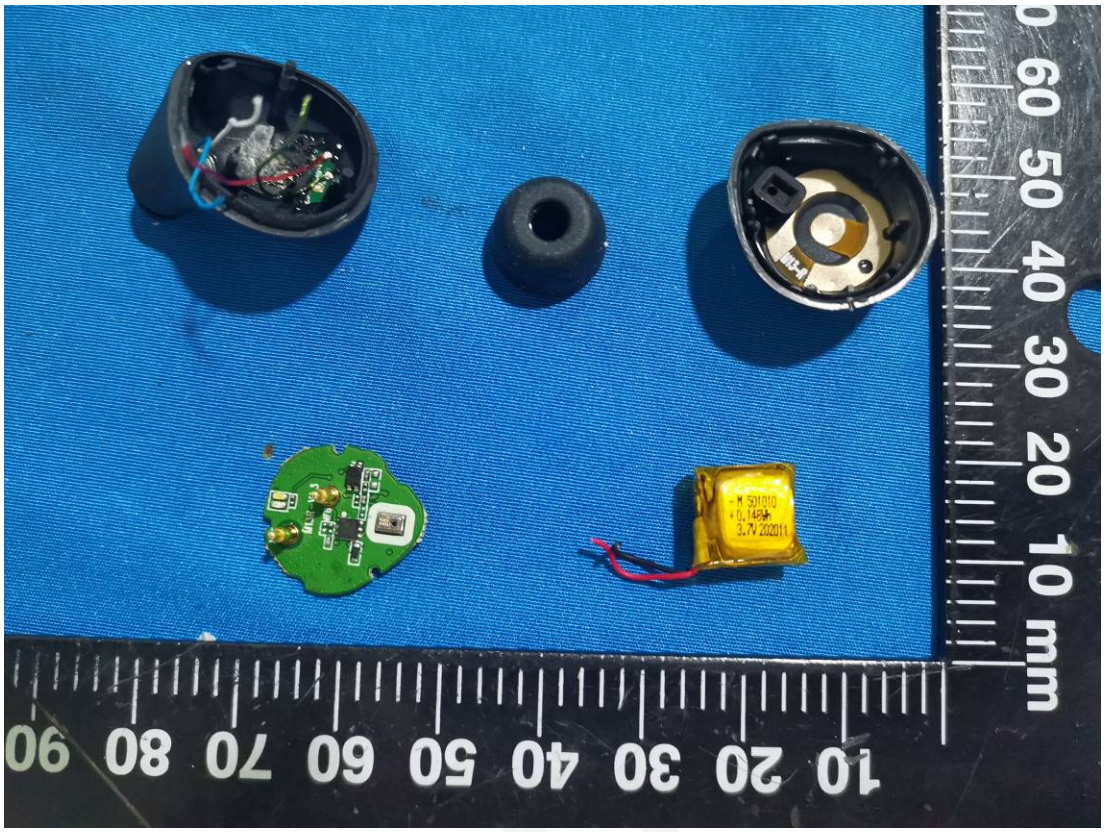
10 20 30 40 50 60 70 80
10 mm 20 30 40 50

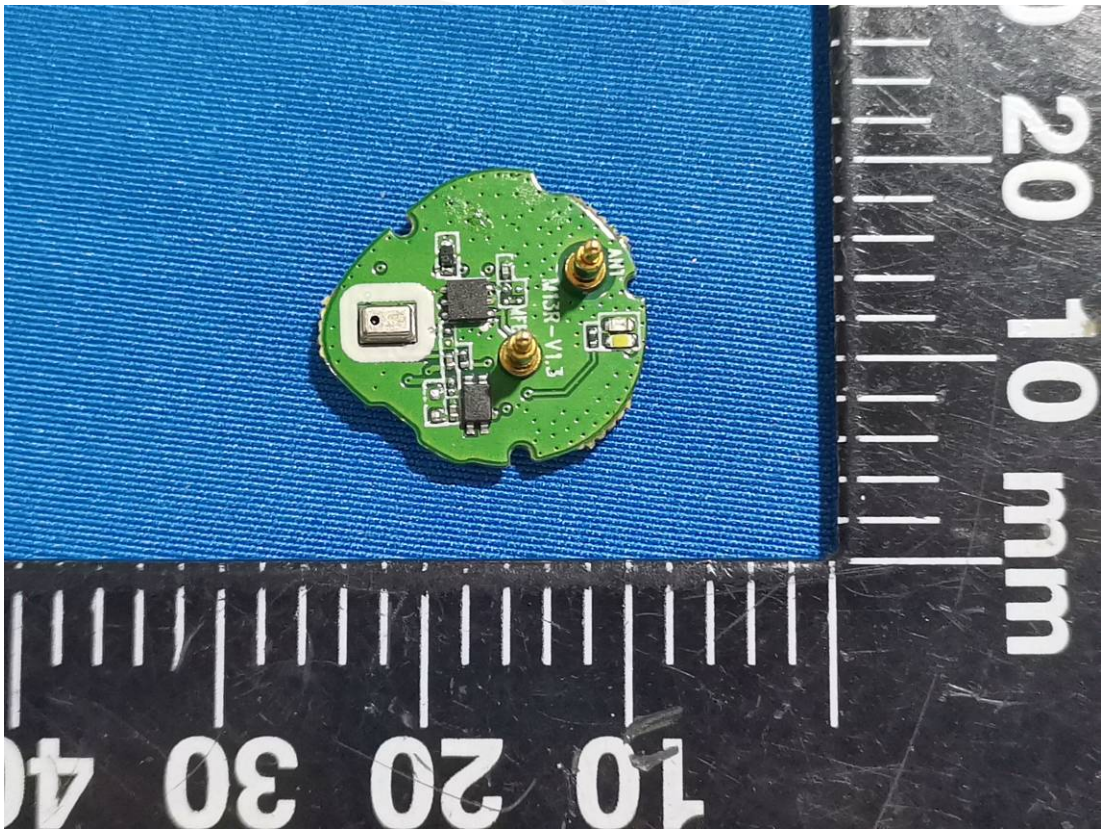

10 20 30 40 50 60 70
10 20 30 mm

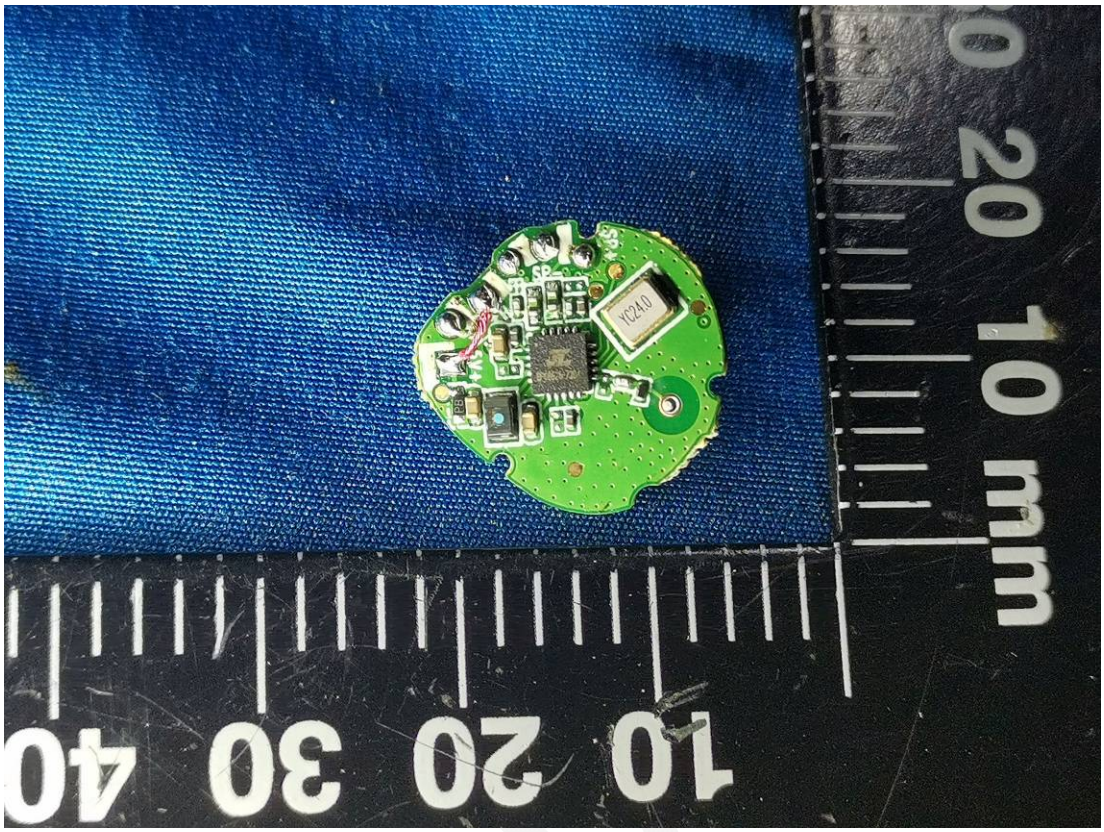
10 20 30 40 50 60 70 80 90 100 10
10 20 30 40 50 60 70 80
10 20 30 mm

10 20 30 40 50 60 70 80
10 20 30 40 50 60 70 80 90 mm

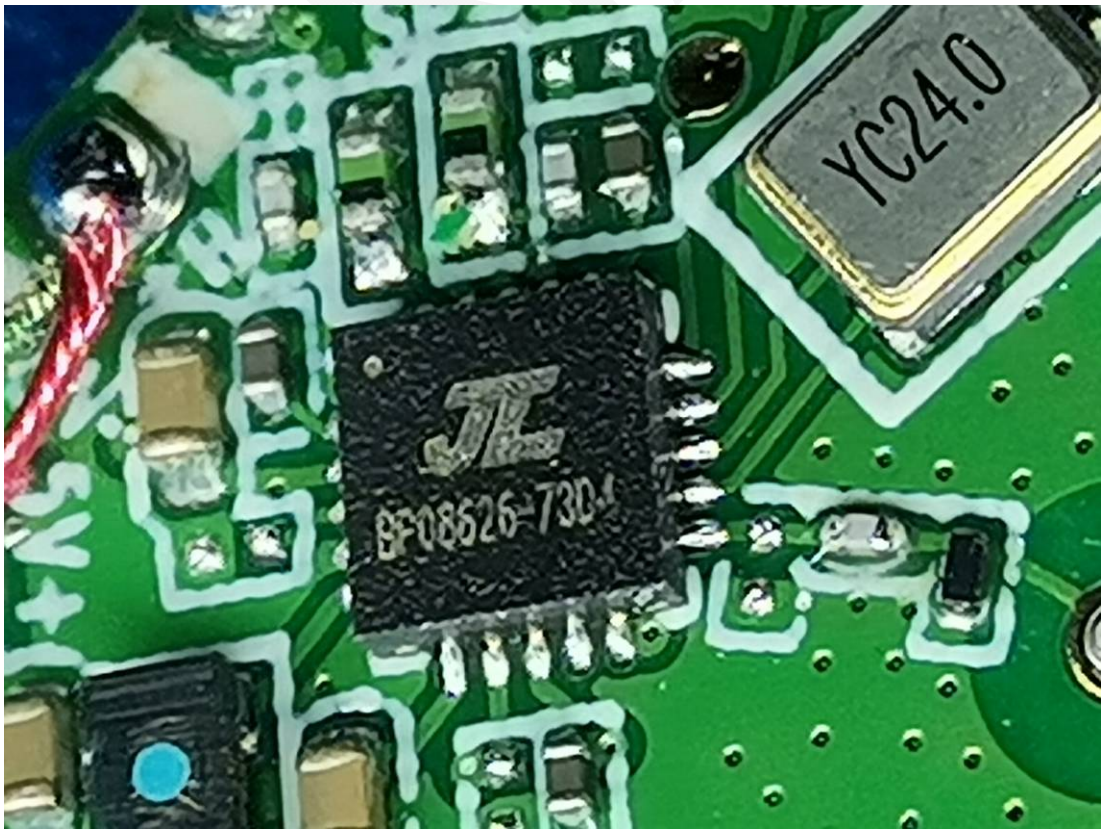
Port


10 20 30 40 50 60 70 80 90
0 10 20 30 40 50 60 mm


M13R-V1.3
10 20 30 40
0 10 20 mm



Chip3



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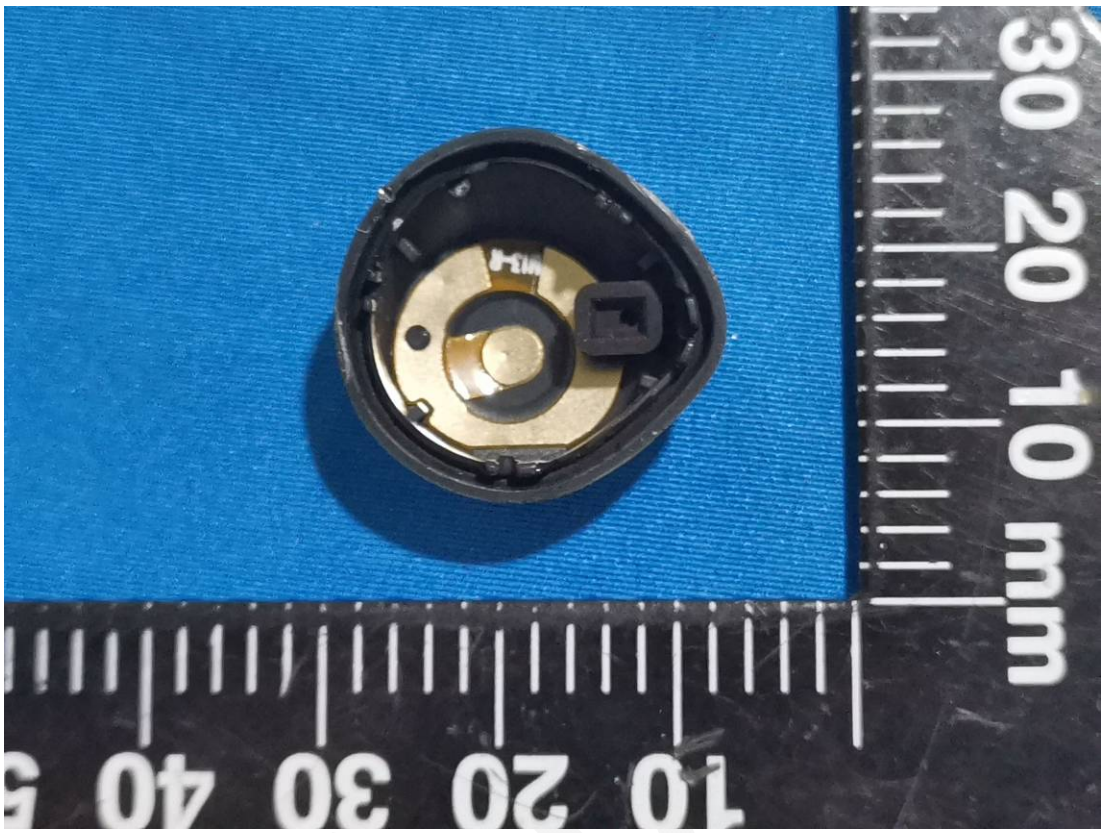

30 20 10 mm
10 20 30 40

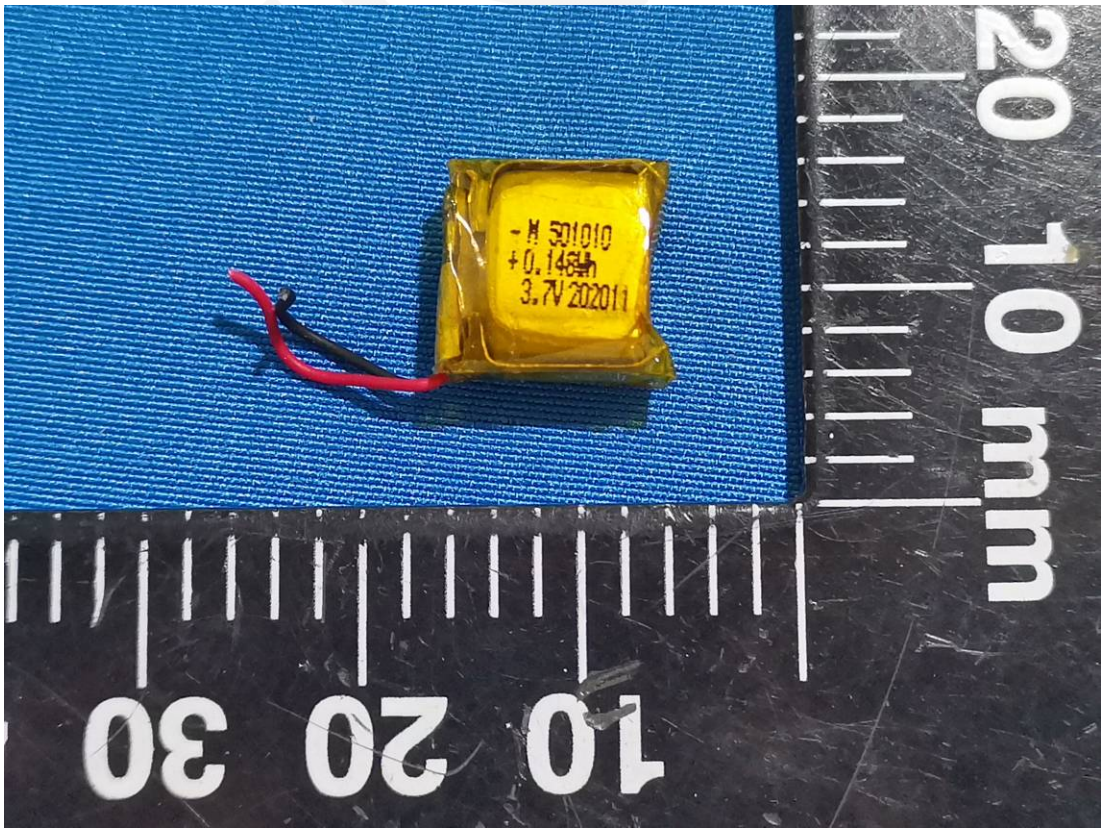
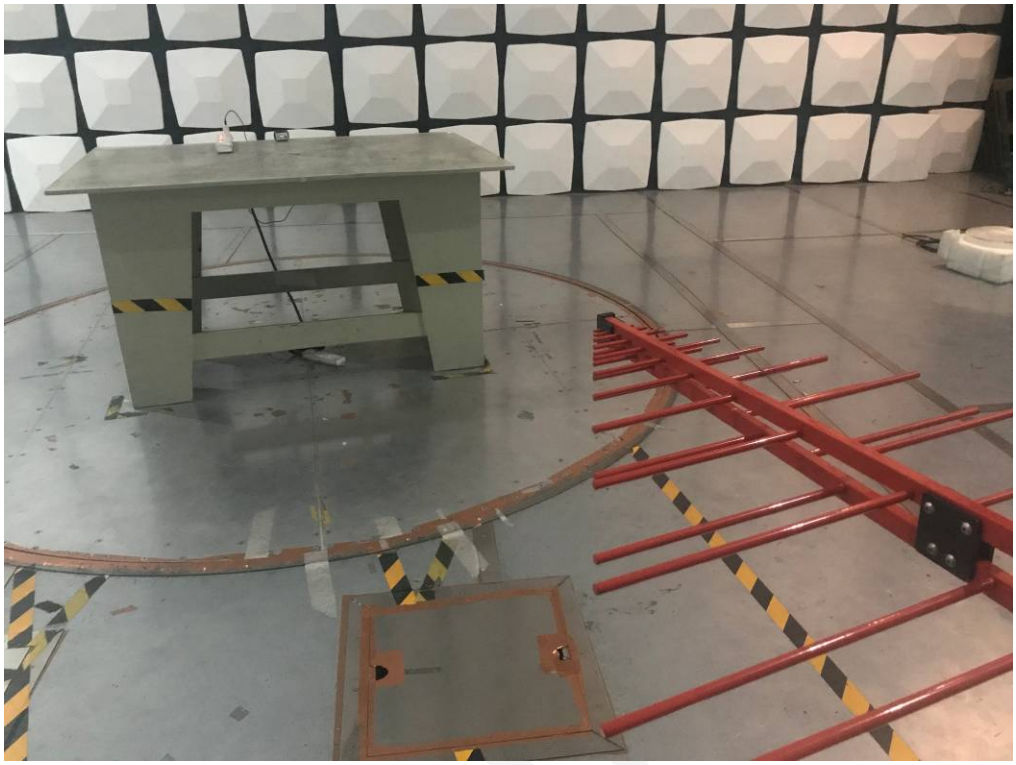

-M 501010
+0.148Wh
3.7V 202011
20 10 mm
10 20 30

EXHIBIT B – TEST SETUP PHOTOGRAPHS

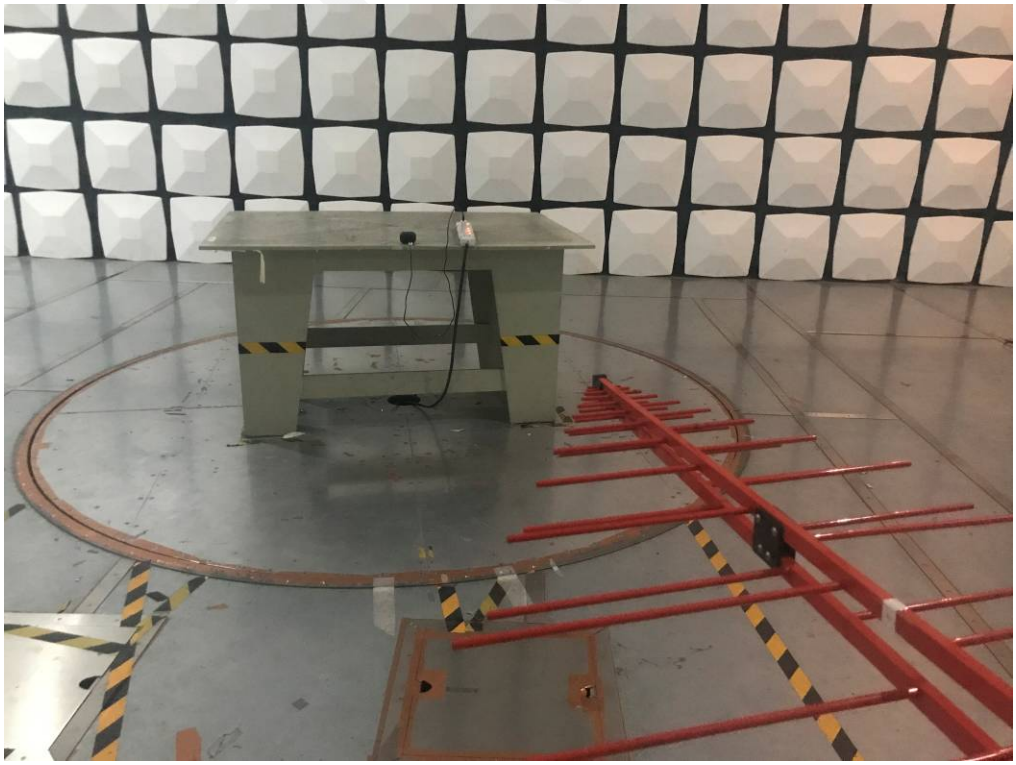
Conducted Emissions Front View

Conducted Emissions Side View

Radiated Emission Below 1G -front View

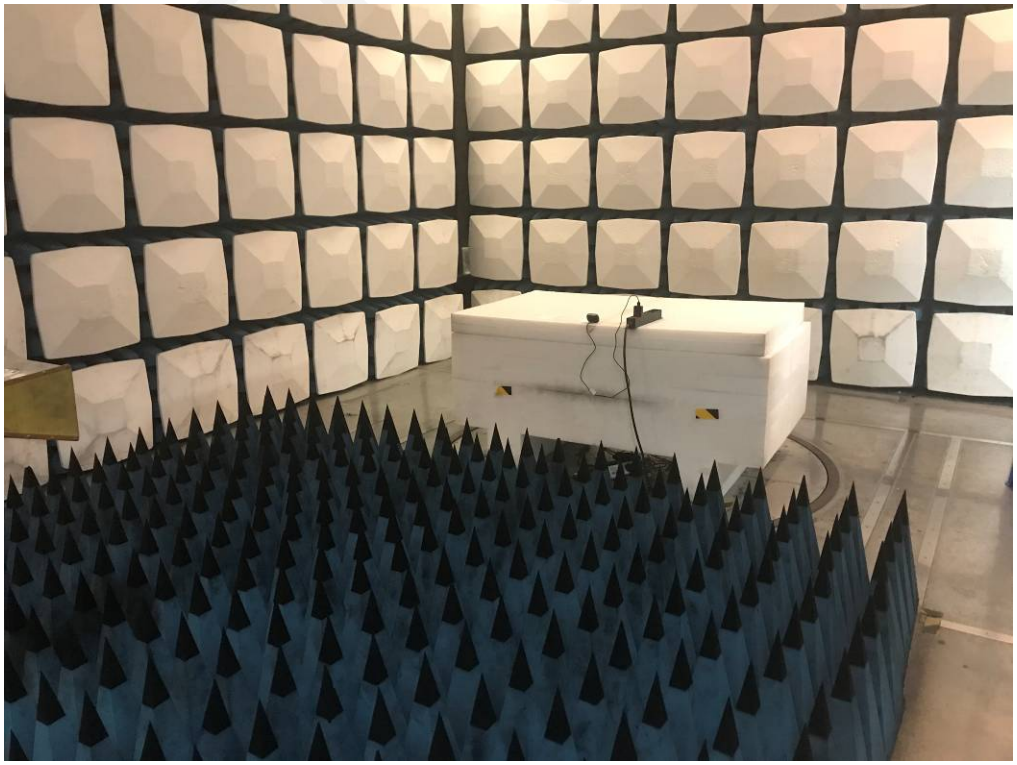


Radiated Emission Below 1G -rear View



Radiated Emission above 1G -front View

Radiated Emission above 1G -rear View



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