



TESTING LABORATORY
CERTIFICATE #4820.01



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

Tested Model: BH413A

Report Type: Original Report	Product Name: True Wireless Earbuds
Report Number:	RDG191108011-00C
Report Date:	2019-12-19
Reviewed By:	Jerry Zhang EMC Manager
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

TABLE OF CONTENTS

General Information.....	3
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	3
OBJECTIVE	3
TEST METHODOLOGY	3
MEASUREMENT UNCERTAINTY	3
TEST FACILITY	4
DECLARATIONS	4
System Test Configuration.....	5
DESCRIPTION OF TEST CONFIGURATION.....	5
EQUIPMENT MODIFICATIONS.....	5
EUT EXERCISE SOFTWARE	5
LOCAL SUPPORT EQUIPMENT LIST AND DETAILS	5
SUPPORT CABLE LIST AND DETAILS.....	5
BLOCK DIAGRAM OF TEST SETUP	6
TEST EQUIPMENT LIST	7
ENVIRONMENTAL CONDITIONS	7
Summary of Test Results.....	8
Conducted emissions.....	9
EUT SETUP	9
EMI TEST RECEIVER SETUP	9
TEST PROCEDURE	9
TEST DATA.....	11
Radiated emissions.....	13
EUT SETUP	13
EMI TEST RECEIVER SETUP	14
TEST PROCEDURE	14
CORRECTED AMPLITUDE & MARGIN CALCULATION.....	14
TEST DATA.....	15
Exhibit A – Eut Photographs	19
Exhibit B – Test Setup Photographs.....	27

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:	True Wireless Earbuds
EUT Model:	BH413A
Highest Operation Frequency:	2402MHz-2480MHz
Rated Input Voltage:	DC 3.7V from battery or DC 5V from charging
Serial Number:	RDG191108011-RF-S1
EUT Received Date:	2019.11.11
EUT Received Status:	Good

Objective

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

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

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.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Dongguan).

Measurement Uncertainty

Parameter	Measurement Uncertainty
Unwanted Emissions, radiated	30M~200MHz: 4.55 dB, 200M~1GHz: 5.92 dB, 1G~6GHz: 4.98 dB, 6G~18GHz: 5.89 dB, 18G~26.5G: 5.47 dB, 26.5G~40G: 5.63 dB
Temperature	±1 °C
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.69 Pulongcun, Puxihu Industry Area, Tangxia, 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 “Δ”. 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.

This report cannot be reproduced except in full, without prior written approval of the Company.

This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

This report may contain data that are not covered by the accreditation scope and shall be marked with an asterisk “★”.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for typical use mode.

Equipment Modifications

No modification was made to the EUT.

EUT Exercise Software

No Software was used in test.

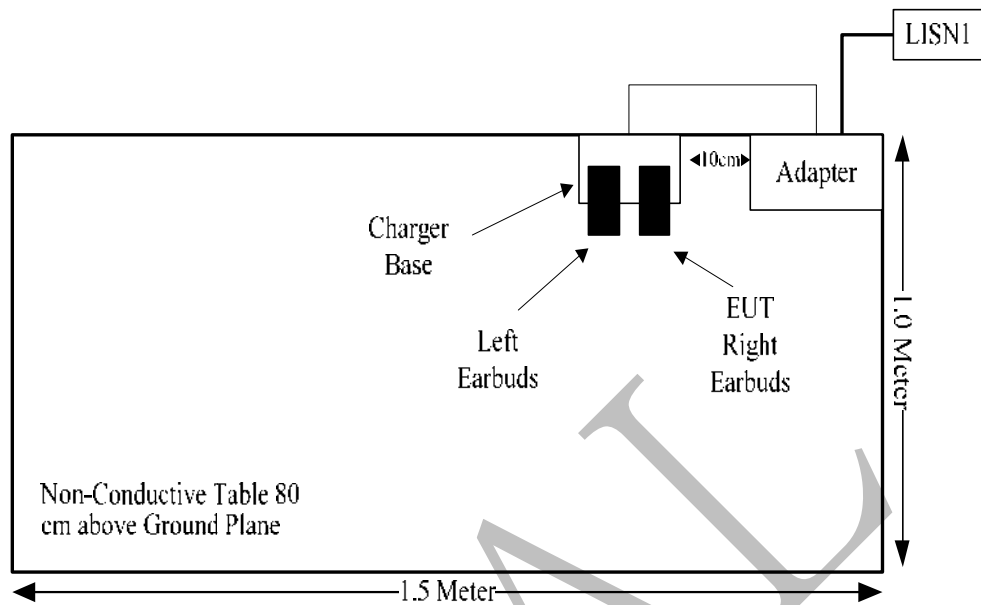
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Switching Power Supply	adapter	HB05M-0501501SPA	7376088

Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
USB Cable	yes	No	1.0	Adapter	EUT

Block Diagram of Test Setup



Test Equipment List

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted emissions					
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-01	2019-09-05	2020-09-05
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A
R&S	Two-line V-network	ENV 216	101614	2018-12-10	2019-12-10
R&S	EMI Test Receiver	ESPI	100120	2019-05-09	2020-05-09
Radiated emissions Below 1GHz					
R&S	EMI Test Receiver	ESCI	100035	2019-08-03	2020-08-03
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
Sunol Sciences	Antenna	JB3	A060611-2	2017-08-25	2020-08-25
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-02	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0530-01	2019-09-24	2020-09-24
Sonoma	Amplifier	310N	185914	2019-10-13	2020-10-13
Radiated emissions Above 1GHz					
Agilent	Spectrum Analyzer	E4440A	SG43360054	2019-05-09	2020-05-09
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2019-09-05	2020-09-05
MITEQ	Amplifier	AFS42-00101800-25-S-42	2001271	2019-09-05	2020-09-05

* 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 above 1GHz
Test Date:	2019-12-03	2019-11-21	2019-12-05
Tester:	Sem Xiang	Jackson Zhang	Lucy Lu
Temperature:	21.1°C	22.9°C	22.3°C
Relative Humidity:	27%	40%	40%
ATM Pressure:	101.1kPa	100.6kPa	100.6kPa

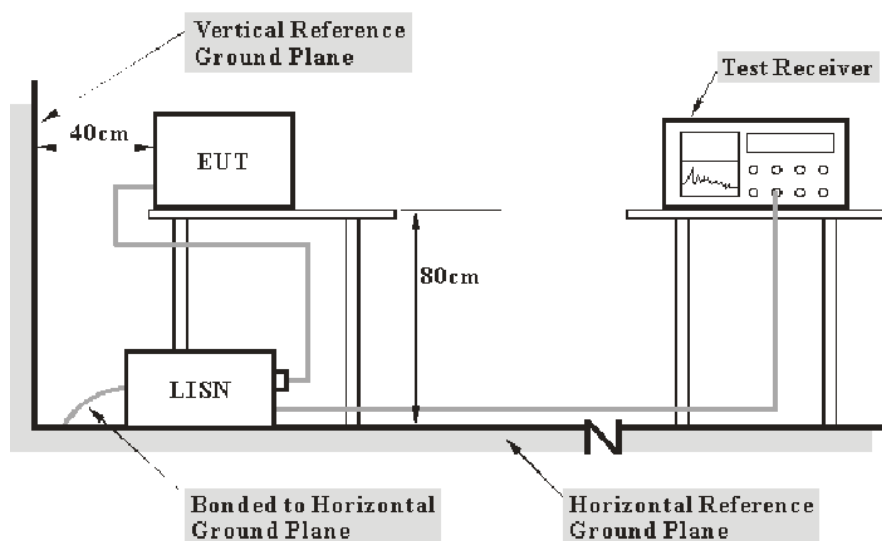
SUMMARY OF TEST RESULTS

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

FINAL

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.

The EUT was connected to the Main LISN with 120V/60Hz AC power source.

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 EUT was connected to the outlet of the first LISN and the other support equipments were connected to the outlet of the second LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$V_C = V_R + A_C + VDF$$

Herein,

V_C : corrected voltage amplitude

V_R : reading voltage amplitude

A_C : attenuation caused by cable loss

VDF: voltage division factor of AMN or ISN

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 limit. The equation for margin calculation is as follows:

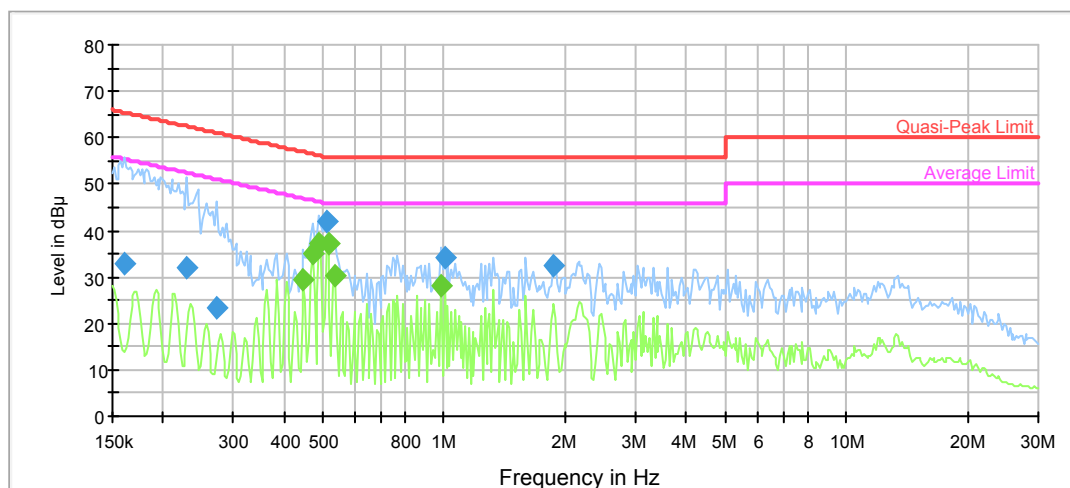
$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

FINAL

Test Data

Please refer to following table and plots:

Model: BH413A
 Port: L
 Test Mode: Charging
 Power Source: AC 120V/60Hz



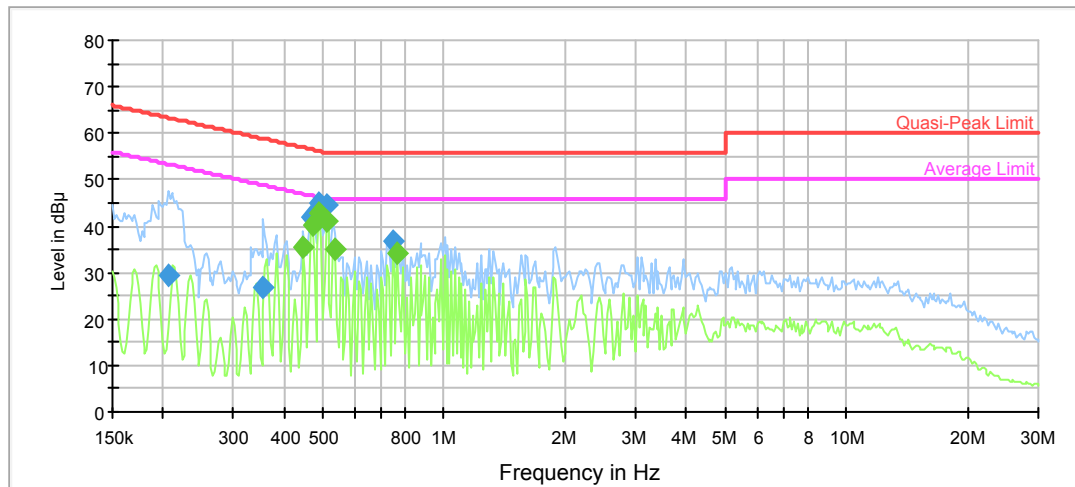
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.160820	32.9	9.000	L1	11.0	32.5	65.4
0.230097	32.1	9.000	L1	10.4	30.3	62.4
0.272505	23.2	9.000	L1	10.2	37.8	61.0
0.510059	42.0	9.000	L1	9.9	14.0	56.0
1.003400	34.4	9.000	L1	9.8	21.6	56.0
1.878108	32.4	9.000	L1	9.7	23.6	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.448170	29.2	9.000	L1	9.9	17.7	46.9
0.471031	34.9	9.000	L1	9.9	11.6	46.5
0.490157	37.2	9.000	L1	9.9	9.0	46.2
0.515160	37.0	9.000	L1	9.9	9.0	46.0
0.536077	30.2	9.000	L1	9.9	15.8	46.0
0.983629	28.0	9.000	L1	9.8	18.0	46.0

Model BH413A
Port: N
Test Mode: Charging
Power Source: AC 120V/60Hz



Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.206241	29.3	9.000	N	10.6	34.1	63.4
0.356493	26.7	9.000	N	10.0	32.1	58.8
0.466367	41.9	9.000	N	9.9	14.7	56.6
0.490157	45.0	9.000	N	9.9	11.2	56.2
0.510059	44.6	9.000	N	9.9	11.4	56.0
0.744445	36.9	9.000	N	9.8	19.1	56.0

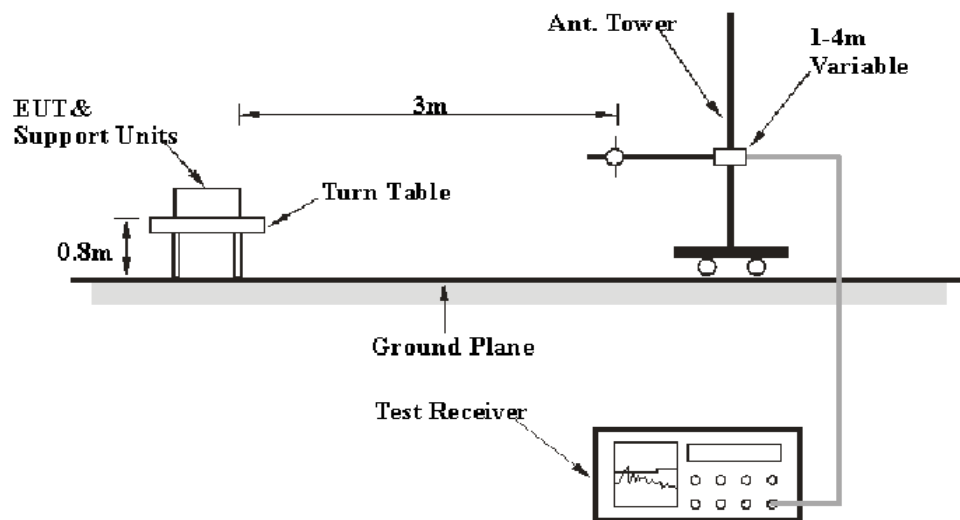
Final Result 2

Frequency (MHz)	Average (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.448170	35.4	9.000	N	9.9	11.5	46.9
0.471031	40.3	9.000	N	9.9	6.2	46.5
0.490157	42.8	9.000	N	9.9	3.4	46.2
0.510059	41.2	9.000	N	9.9	4.8	46.0
0.536077	35.0	9.000	N	9.9	11.0	46.0
0.767003	34.1	9.000	N	9.8	11.9	46.0

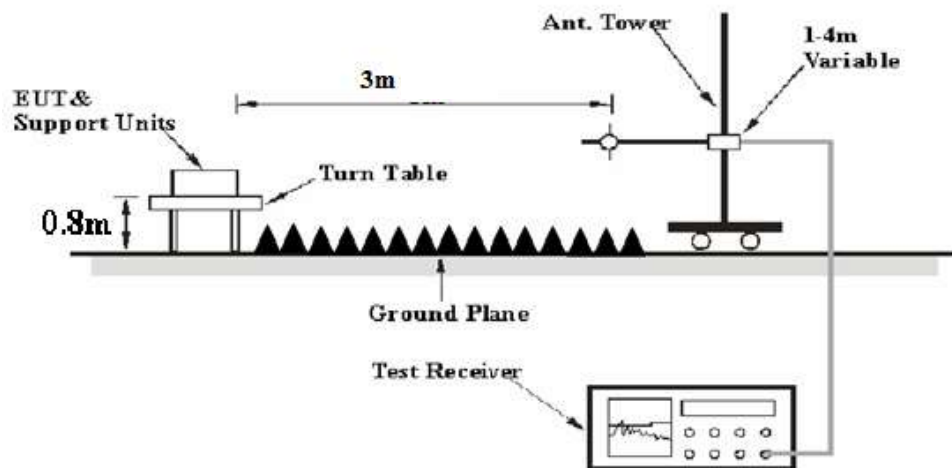
RADIATED EMISSIONS

EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission below 1GHz tests were performed in the 10 meters chamber test site, above 1GHz tests were performed in the 3 meters chamber test site B, using the setup accordance with the ANSI C63.4-2014. The specification used was with the FCC Part 15 B 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

If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

Test Procedure

During the radiated emissions, the adapter of laptop was connected to the first AC floor outlet and the other support equipments were connected to the second 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:

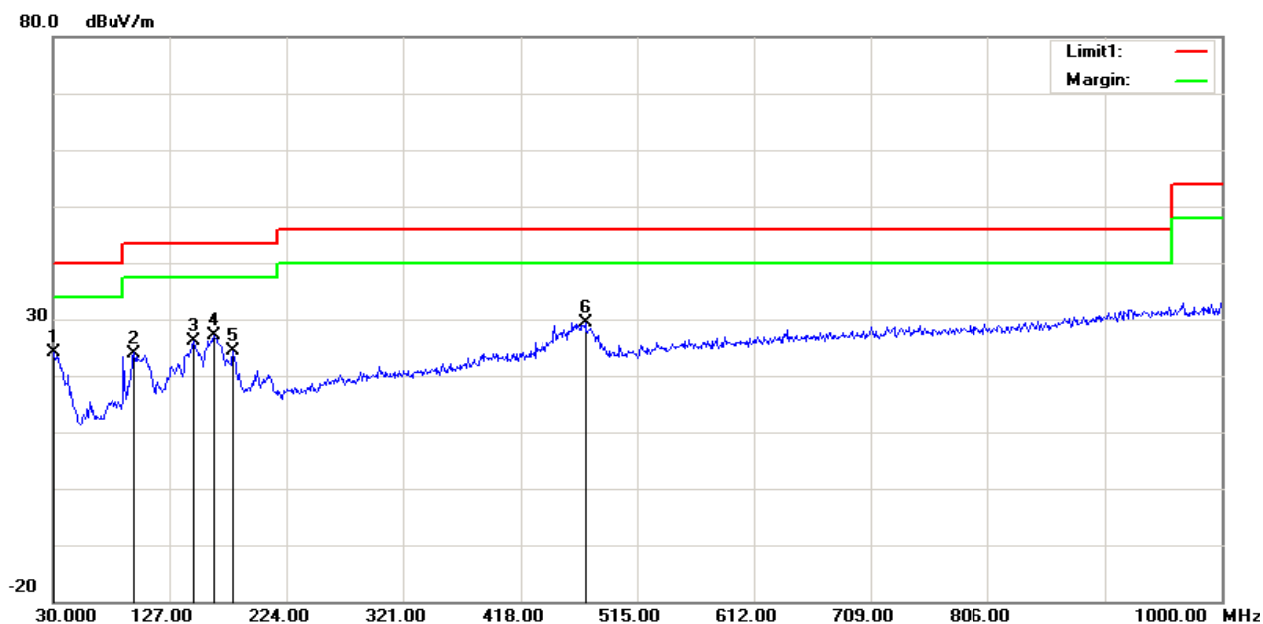
$$\text{Margin} = \text{Limit} - \text{Result}$$

Test Data

Please refer to following table and plots:

Condition: FCC Part 15B Class B
EUT: True Wireless Earbuds
Model: BH413A
Test Mode: Charging
Note:

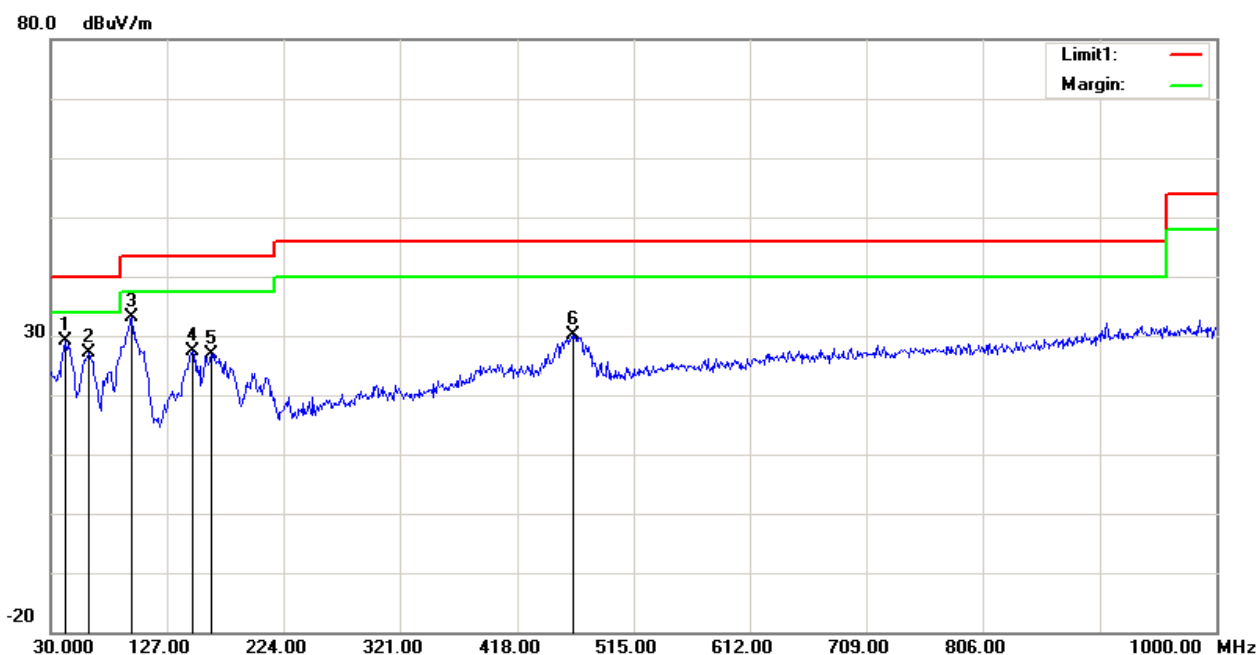
Polarization: Horizontal
Power: AC 120V/60Hz
Distance: 3m



No.	Frequency (MHz)	Reading (dBuV)	Detector	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	30.0000	28.45	peak	-4.29	24.16	40.00	15.84
2	97.9000	38.30	peak	-14.30	24.00	43.50	19.50
3	147.3700	35.35	peak	-9.26	26.09	43.50	17.41
4	163.8600	36.47	peak	-9.26	27.21	43.50	16.29
5	179.3800	34.37	peak	-10.05	24.32	43.50	19.18
6	472.3200	33.44	peak	-4.03	29.41	46.00	16.59

Condition: FCC Part 15B Class B
EUT: True Wireless Earbuds
Model: BH413A
Test Mode: Charging
Note:

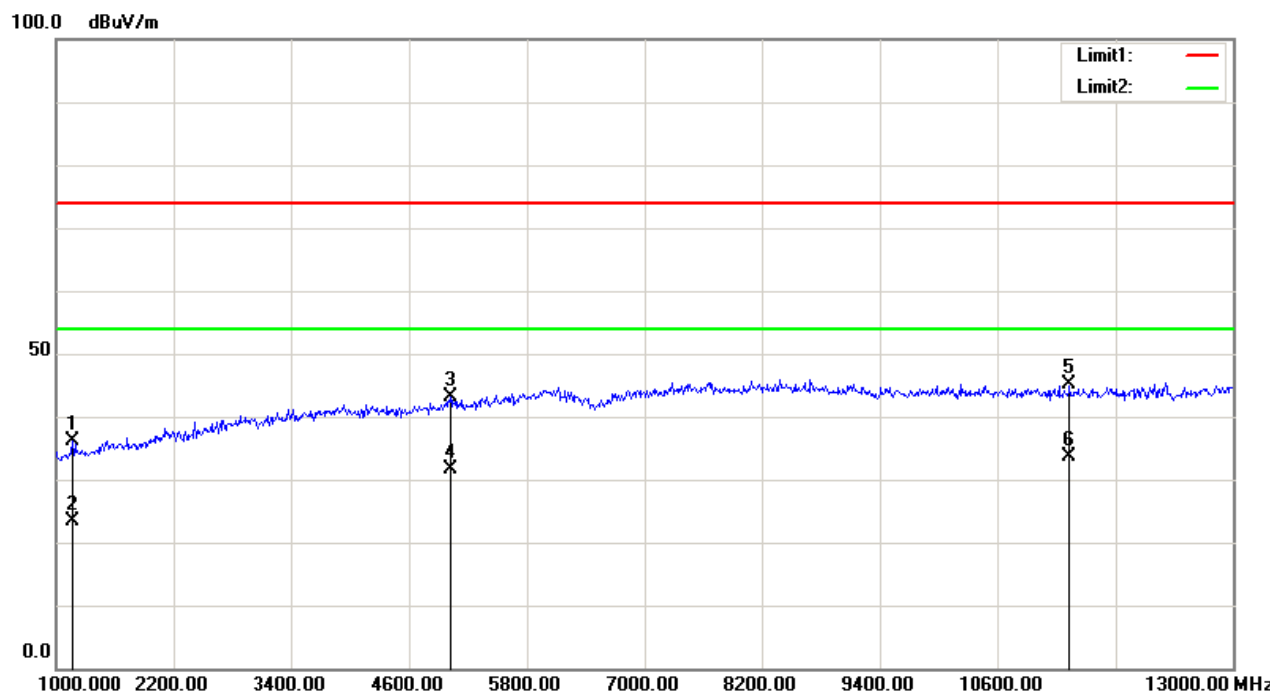
Polarization: Vertical
Power: AC 120V/60Hz
Distance: 3m



No.	Frequency (MHz)	Reading (dBuV)	Detector	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	42.6100	40.24	peak	-11.16	29.08	40.00	10.92
2	62.0100	43.67	peak	-16.53	27.14	40.00	12.86
3	97.9000	47.37	peak	-14.30	33.07	43.50	10.43
4	148.3400	36.72	peak	-9.30	27.42	43.50	16.08
5	163.8600	36.09	peak	-9.26	26.83	43.50	16.67
6	464.5600	34.14	peak	-4.09	30.05	46.00	15.95

Condition: FCC Part 15B Class B
EUT: True Wireless Earbuds
Model: BH413A
Test Mode: Charging
Note:

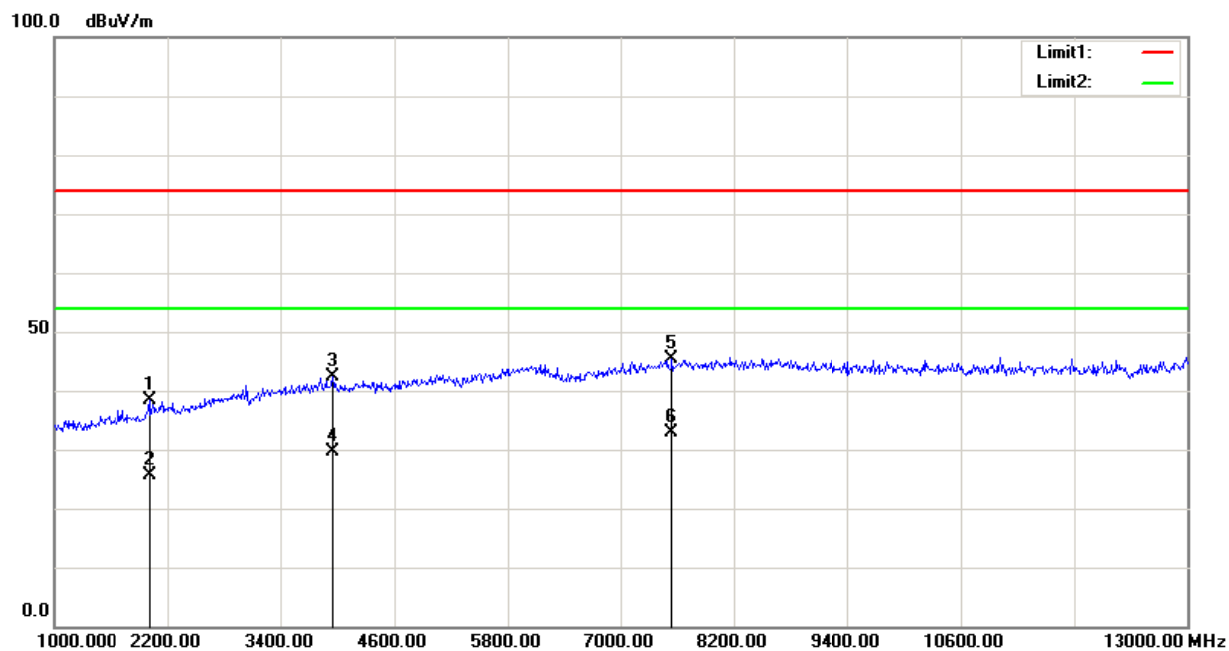
Polarization: Horizontal
Power: AC 120V/60Hz
Distance: 3m



No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	1168.000	37.98	peak	-1.92	36.06	74.00	37.94
2	1168.000	25.21	AVG	-1.92	23.29	54.00	30.71
3	5020.000	35.45	peak	7.72	43.17	74.00	30.83
4	5020.000	23.84	AVG	7.72	31.56	54.00	22.44
5	11338.000	31.80	peak	13.35	45.15	74.00	28.85
6	11338.000	20.35	AVG	13.35	33.70	54.00	20.30

Condition: FCC Part 15B Class B
EUT: True Wireless Earbuds
Model: BH413A
Test Mode: Charging
Note:

Polarization: Vertical
Power: AC 120V/60Hz
Distance: 3m



No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2008.000	36.36	peak	1.98	38.34	74.00	35.66
2	2008.000	23.54	AVG	1.98	25.52	54.00	28.48
3	3958.000	35.99	peak	6.46	42.45	74.00	31.55
4	3958.000	23.25	AVG	6.46	29.71	54.00	24.29
5	7540.000	34.88	peak	10.60	45.48	74.00	28.52
6	7540.000	22.36	AVG	10.60	32.96	54.00	21.04

EXHIBIT A – EUT PHOTOGRAPHS

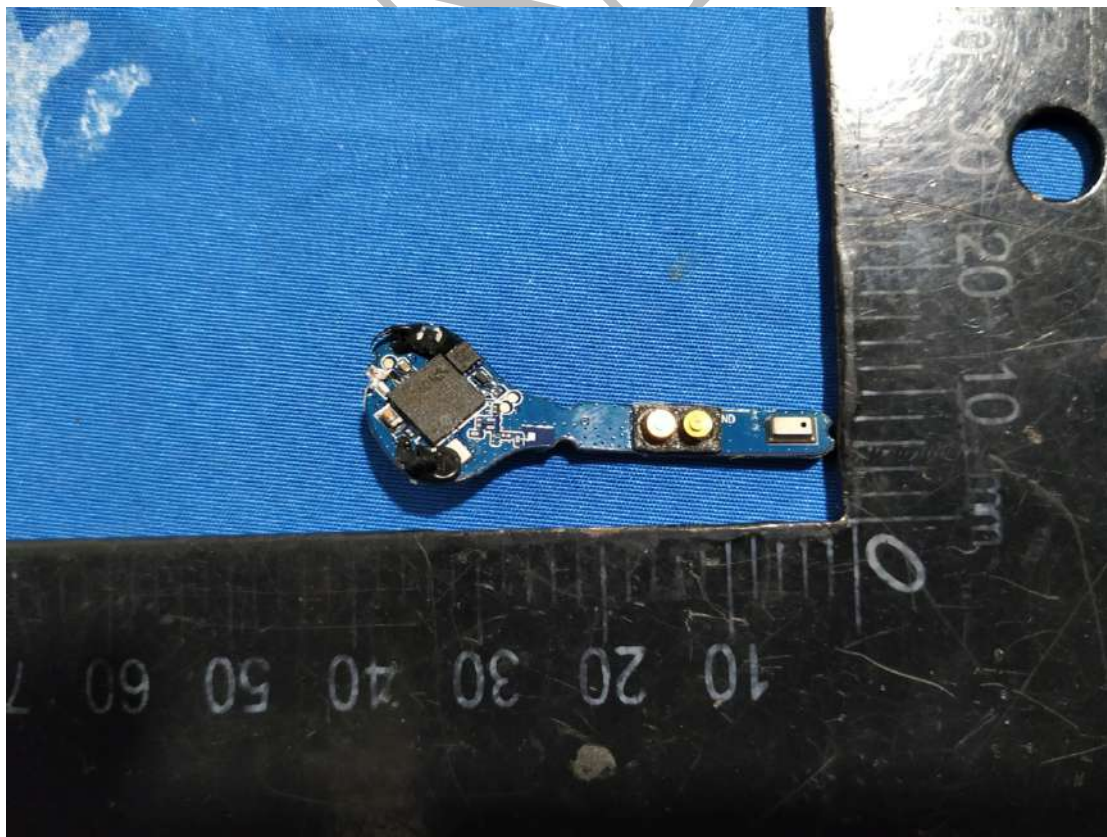














ANT



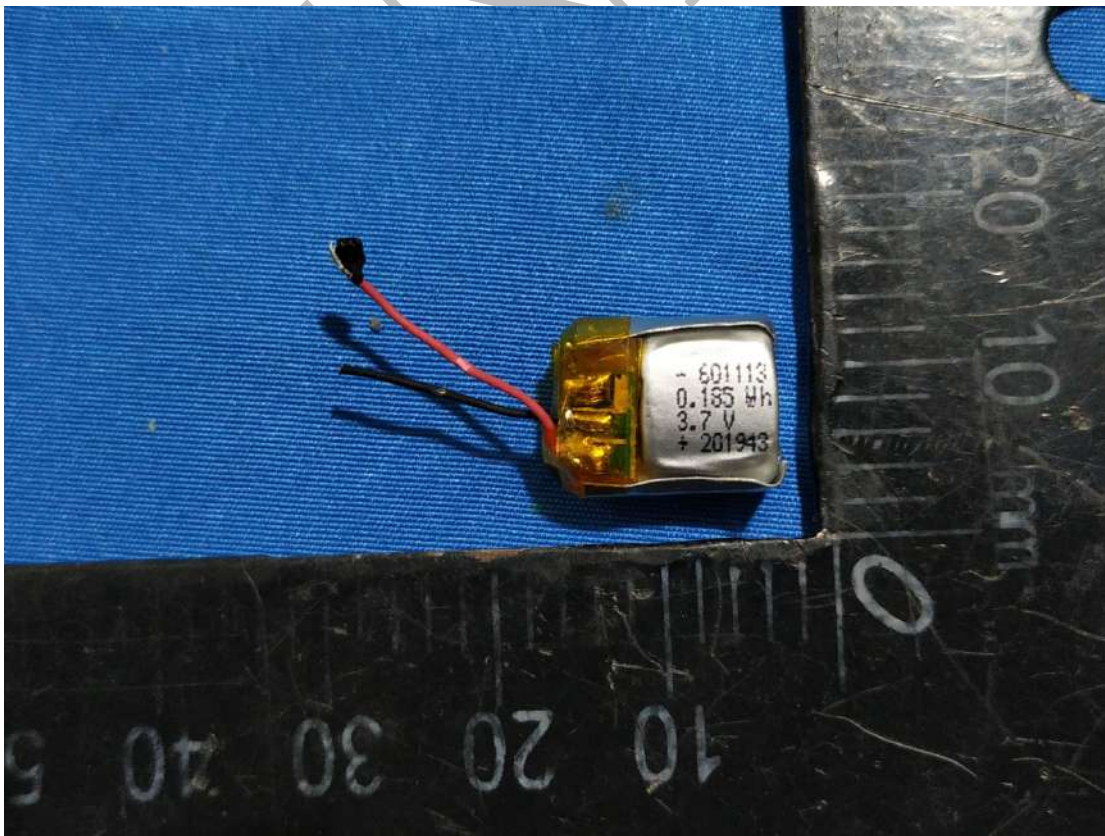


EXHIBIT B – TEST SETUP PHOTOGRAPHS

CE Front View



CE Side View



RE Below 1G front View



RE Below 1G rear View



RE Above 1G front View



RE Above 1G rear View



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