TEST REPORT

Application No.:	SZEM2010010288CR
Applicant:	OnePlus Technology (Shenzhen) Co., Ltd.
Address of Applicant:	18C02, 18C03, 18C04 and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen, China
Manufacturer:	OnePlus Technology (Shenzhen) Co., Ltd.
Address of Manufacturer:	18C02, 18C03, 18C04 and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen, China
Factory:	Please refer to section 2
Address of Factory:	Please refer to section 2
Equipment Under Test (EUT):	
EUT Name:	OnePlus Buds Z
Model No.:	E502A
Trade mark:	ONEPLUS
FCC ID:	2ABZ2-E502A
Standard(s) :	47 CFR Part 15, Subpart B
Date of Receipt:	2020-10-15
Date of Test:	2020-10-19 to 2020-11-03
Date of Issue:	2020-11-20
Test Result:	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu
EMC Laboratory Manager

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Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2020-11-20		Original

Authorized for issue by:				
		Bill Chen **Bill Chen/Project Engineer**		
		Eric Fu **Eric Fu/Reviewer**		

2 Test Summary

Emission Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Conducted Emissions at Mains Terminals (150kHz-30MHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass
Radiated Emissions (30MHz-1GHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass

Factory:	**Address of Factory:**
Shenzhen sunynn Technology Co., Ltd.	201, building C, Xinxing Industrial Park, no. 3151 Shahe West Road, Shuguang Community, Xili Street, Nanshan District, Shenzhen City
Jiangxi Risound Electronics Co., Ltd.	No.271, Innovation Avenue, Jinggangshan Economic and Technological Development Zone, Ji'an City, Jiangxi Province.
Hunan sunynn Technology Co., Ltd.	Building 3&4, Intelligent Home Appliance Industrial park, North Xieyuan Road, Ningxiang Economic and Technological Development Zone, Changsha City
Shenzhen Sunwinon Electronics Co., Ltd.	Floor 1-6 of 4# Building 101, No. 6-6, Yanshan avenue, Yanchuan community, Yanluo street, Bao'an district, Shenzhen 518108, P.R. China.

Remark:

Model No.: ONEPLUS

This test report (Ref. No.: SZEM201001028801) is only valid with the original test report (Ref. No.: SZEM200800775201).

Review this report and original report, this report just added the new photos and changed the supplier of the battery.

According to the declaration from the applicant, the model in this report and model in original report were identical, with only difference on secondary supply battery and reduce RF output power.

Considering to the difference, pre-scan were performed on the sample in this report to find the items which can be influential to the result in the original test report for fully retest.

Therefore in this report Conducted Emissions at Mains Terminals (150kHz-30MHz) and Radiated Emissions (30MHz-1GHz) were fully retested on model ONEPLUS and shown the data in this report.

3 Contents

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4 General Information

4.1 Details of E.U.T.

Battery:	Charging BOX: Rechargeable battery DC 3.8V 450mAh (Charged by Type-C) Left earphone: Rechargeable battery DC 3.8V 40mAh (Charged by Charging BOX) Right earphone: Rechargeable battery DC 3.8V 40mAh (Charged by Charging BOX)
The highest working frequency:	26MHz

4.2 Cable

Cable	Length	Shielding	Core
Type-C	20cm	Unshielded	Non-Core

4.3 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Adapter	HUAWEI	HW-050100A01	REF. No.SEA0504F

4.4 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Emissions at Mains Terminals (150kHz-30MHz)	± 3.0dB
Radiated Emissions (30MHz-1GHz)	± 4.5dB

Remark:
The U_{lab} (lab Uncertainty) is less than U_{cispr} (CISPR Uncertainty), so the test results
– compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
– non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• **VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

• **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

4.7 Deviation from Standards

None

4.8 Abnormalities from Standard Conditions

None

5 Equipment List

Conducted Emissions at Mains Terminals (150kHz-30MHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Shielding Room	ZhongYu Electron	GB-88	SEM001-06	2019-06-13	2022-06-12
EMI Test Receiver	Rohde&Schwarz	ESCI	SEM004-02	2020-03-24	2021-03-23
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM024-01	2020-07-10	2021-07-09
LISN	Rohde&Schwarz	ENV216	SEM007-01	2020-09-23	2021-09-22
LISN	ETS-LINDGREN	3816/2	SEM007-02	2020-04-01	2021-03-31

Radiated Emissions (30MHz-1GHz)					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2020-07-19	2023-07-18
MXE EMI Receiver	Agilent Technologies	N9038A	SEM004-15	2020-11-02	2021-11-01
BiConiLog Antenna	ETS-LINDGREN	3142C	SEM003-02	2019-05-24	2022-05-23
Pre-Amplifier	Agilent Technologies	8447D	SEM005-01	2020-04-01	2021-03-31
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2020-07-10	2021-07-09

General used equipment					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2020-09-15	2021-09-14
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2020-09-15	2021-09-14
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2020-04-07	2021-04-06

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6 Emission Test Results

6.1 Conducted Emissions at Mains Terminals (150kHz-30MHz)

Test Requirement: 47 CFR Part 15, Subpart B
Test Method: ANSI C63.4:2014

Limit:

0.15M-0.5MHz	66dB(μV)-56dB(μV) quasi-peak, 56dB(μV)-46dB(μV) average
0.5M-5MHz	56dB(μV) quasi-peak, 46dB(μV) average
5M-30MHz	60dB(μV) quasi-peak, 50dB(μV) average
Detector:	Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

6.1.1 E.U.T. Operation

Operating Environment:
Temperature: 22.9 °C Humidity: 55.4 % RH Atmospheric Pressure: 1015 mbar

6.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Charging BOX charge mode_Keep the EUT charging
Final test	01	Charging BOX+earphone charge mode_Keep the EUT charging

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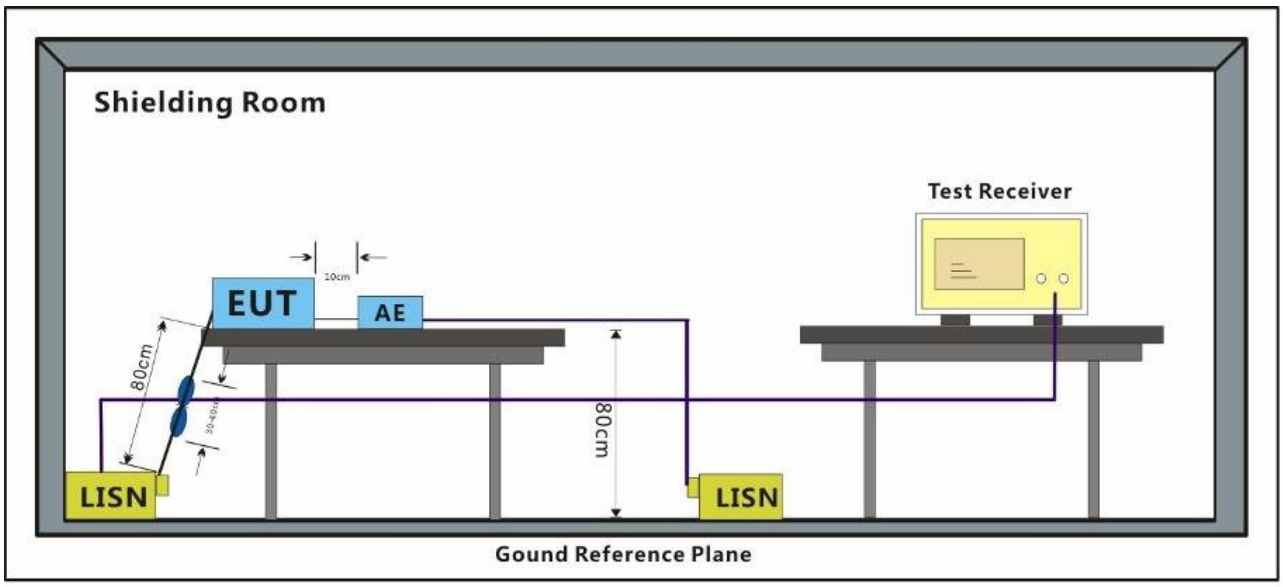
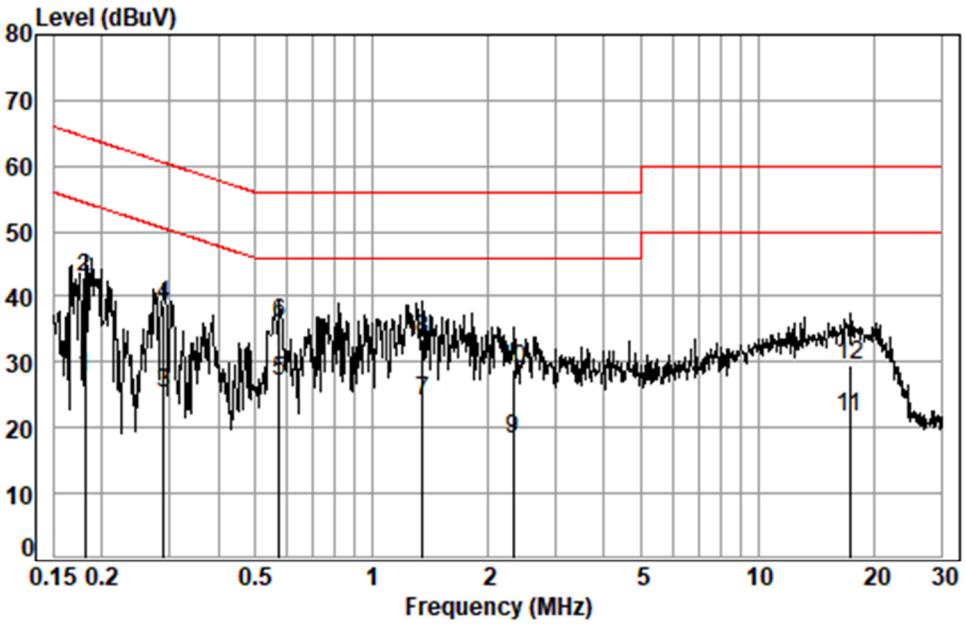
6.1.3 Test Setup Diagram



6.1.4 Measurement Procedure and Data

An initial pre-scan was performed with peak detector.Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.

Test Mode: 00; Line: Live line



Site : Shielding Room
Condition: Line
Job No. : 10288CR
Test mode: 00

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.1806	0.02	9.71	17.81	27.54	54.46	-26.92	Average
2	0.1806	0.02	9.71	33.22	42.95	64.46	-21.51	QP
3	0.2893	0.04	9.74	15.35	25.13	50.54	-25.41	Average
4	0.2893	0.04	9.74	28.86	38.64	60.54	-21.90	QP
5	0.5762	0.07	9.77	17.17	27.01	46.00	-18.99	Average
6	0.5762	0.07	9.77	25.91	35.75	56.00	-20.25	QP
7	1.3521	0.12	9.80	14.04	23.96	46.00	-22.04	Average
8	1.3521	0.12	9.80	23.61	33.53	56.00	-22.47	QP
9	2.3213	0.16	9.82	8.42	18.40	46.00	-27.60	Average
10	2.3213	0.16	9.82	19.00	28.98	56.00	-27.02	QP
11	17.2908	0.22	10.70	10.73	21.65	50.00	-28.35	Average
12	17.2908	0.22	10.70	18.66	29.58	60.00	-30.42	QP

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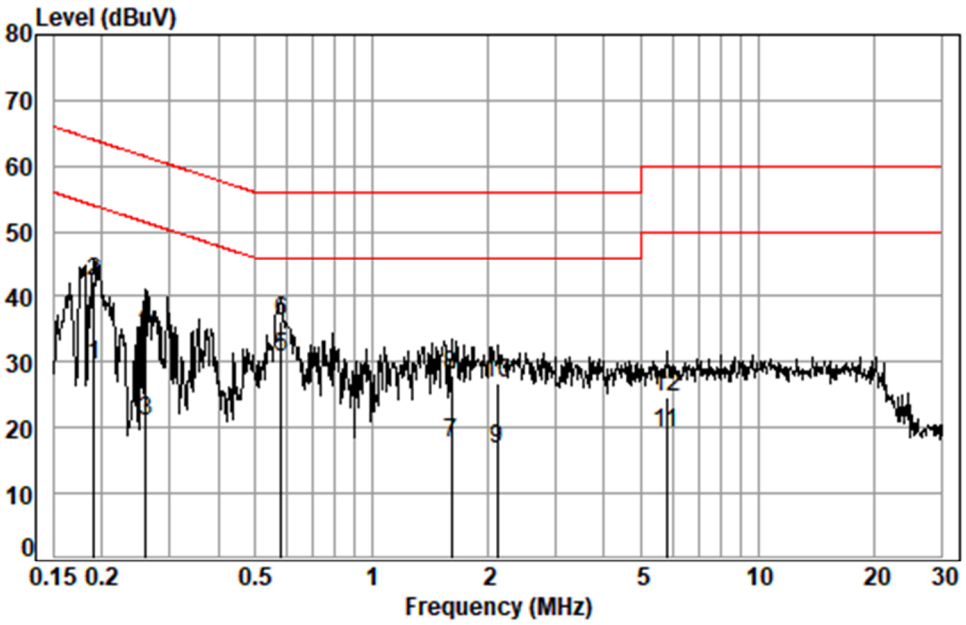
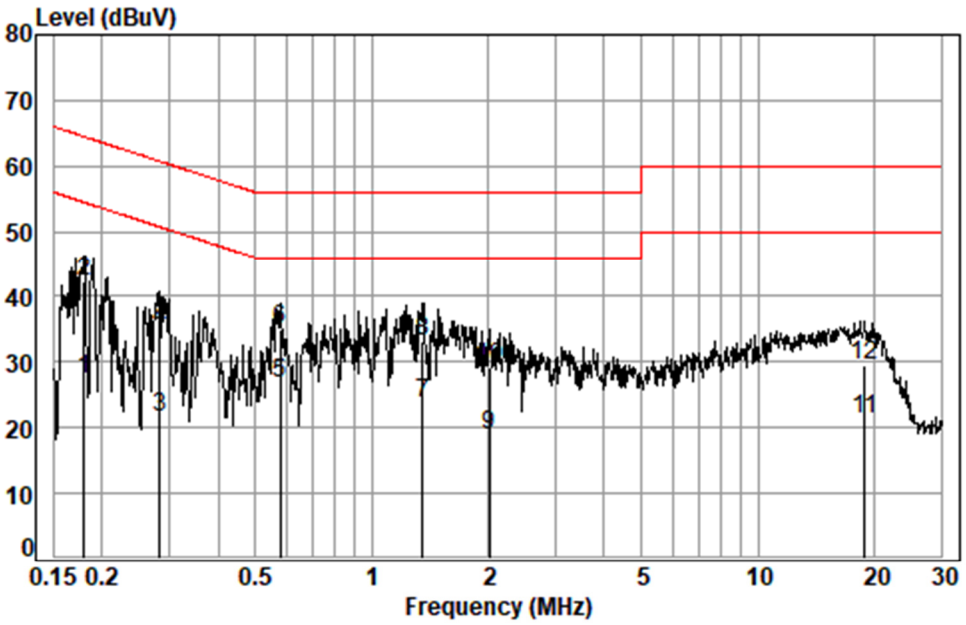
Test Mode: 00; Line: Neutral Line



Site : Shielding Room
Condition: Neutral
Job No. : 10288CR
Test mode: 00

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.1914	0.02	9.72	19.62	29.36	53.98	-24.62	Average
2	0.1914	0.02	9.72	32.56	42.30	63.98	-21.68	QP
3	0.2603	0.03	9.73	11.20	20.96	51.42	-30.46	Average
4	0.2603	0.03	9.73	25.50	35.26	61.42	-26.16	QP
5	0.5823	0.07	9.77	20.97	30.81	46.00	-15.19	Average
6	0.5823	0.07	9.77	26.30	36.14	56.00	-19.86	QP
7	1.6105	0.14	9.79	7.69	17.62	46.00	-28.38	Average
8	1.6105	0.14	9.79	18.02	27.95	56.00	-28.05	QP
9	2.1213	0.16	9.81	6.66	16.63	46.00	-29.37	Average
10	2.1213	0.16	9.81	16.88	26.85	56.00	-29.15	QP
11	5.8050	0.17	9.98	8.91	19.06	50.00	-30.94	Average
12	5.8050	0.17	9.98	14.42	24.57	60.00	-35.43	QP

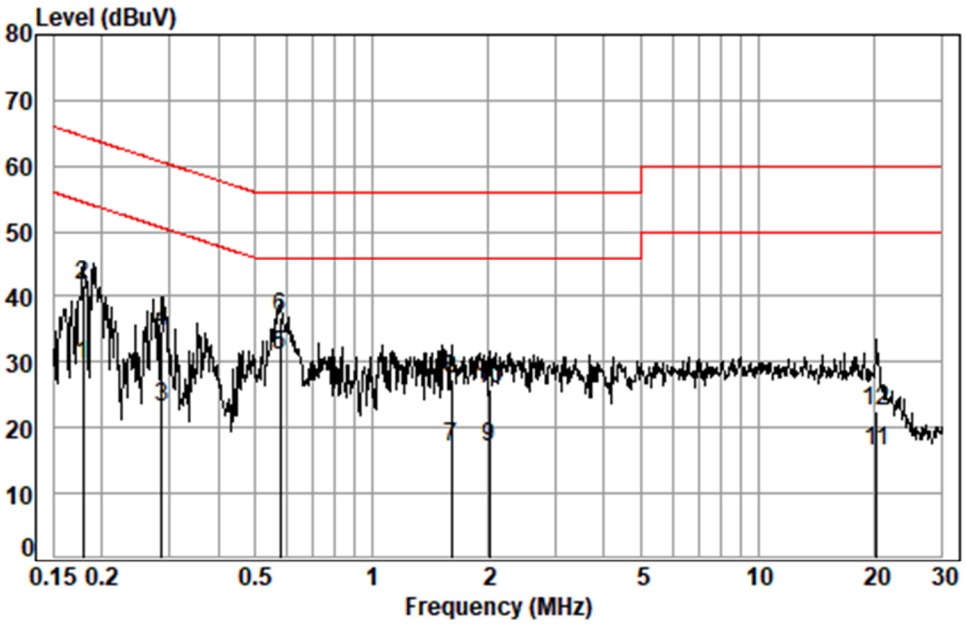
Test Mode: 01; Line: Live line



Site : Shielding Room
Condition: Line
Job No. : 10288CR
Test mode: 01

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.1796	0.02	9.71	17.54	27.27	54.50	-27.23	Average
2	0.1796	0.02	9.71	32.69	42.42	64.50	-22.08	QP
3	0.2818	0.04	9.74	11.95	21.73	50.76	-29.03	Average
4	0.2818	0.04	9.74	25.21	34.99	60.76	-25.77	QP
5	0.5792	0.07	9.77	16.87	26.71	46.00	-19.29	Average
6	0.5792	0.07	9.77	25.12	34.96	56.00	-21.04	QP
7	1.3521	0.12	9.80	13.84	23.76	46.00	-22.24	Average
8	1.3521	0.12	9.80	23.20	33.12	56.00	-22.88	QP
9	2.0119	0.16	9.81	9.02	18.99	46.00	-27.01	Average
10	2.0119	0.16	9.81	19.11	29.08	56.00	-26.92	QP
11	18.9205	0.23	10.82	10.10	21.15	50.00	-28.85	Average
12	18.9205	0.23	10.82	18.48	29.53	60.00	-30.47	QP

Test Mode: 01; Line: Neutral Line



Site : Shielding Room
Condition: Neutral
Job No. : 10288CR
Test mode: 01

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.1787	0.02	9.72	19.66	29.40	54.55	-25.15	Average
2	0.1787	0.02	9.72	32.03	41.77	64.55	-22.78	QP
3	0.2863	0.04	9.74	13.41	23.19	50.63	-27.44	Average
4	0.2863	0.04	9.74	24.85	34.63	60.63	-26.00	QP
5	0.5792	0.07	9.77	21.15	30.99	46.00	-15.01	Average
6	0.5792	0.07	9.77	26.91	36.75	56.00	-19.25	QP
7	1.6105	0.14	9.79	7.20	17.13	46.00	-28.87	Average
8	1.6105	0.14	9.79	17.35	27.28	56.00	-28.72	QP
9	2.0225	0.16	9.81	7.18	17.15	46.00	-28.85	Average
10	2.0225	0.16	9.81	16.00	25.97	56.00	-30.03	QP
11	20.2696	0.24	10.85	5.19	16.28	50.00	-33.72	Average
12	20.2696	0.24	10.85	11.29	22.38	60.00	-37.62	QP

6.2 Radiated Emissions (30MHz-1GHz)

Test Requirement: 47 CFR Part 15, Subpart B
Test Method: ANSI C63.4:2014

Limit:

FREQUENCY (MHz)	dBuV/m (At 10m)	dBuV/m (At 3m)
	Class B	Class B
30MHz -88MHz	29.5(dBμV/m) quasi-peak	40.0(dBμV/m) quasi-peak
88MHz-216MHz	33.1(dBμV/m) quasi-peak	43.5(dBμV/m) quasi-peak
216MHz-960MHz	35.6(dBμV/m) quasi-peak	46.0(dBμV/m) quasi-peak
960MHz-1000MHz	43.5(dBμV/m) quasi-peak	54.0(dBμV/m) quasi-peak
Detector: Peak for pre-scan (120kHz resolution bandwidth) 30M to 1000MHz		

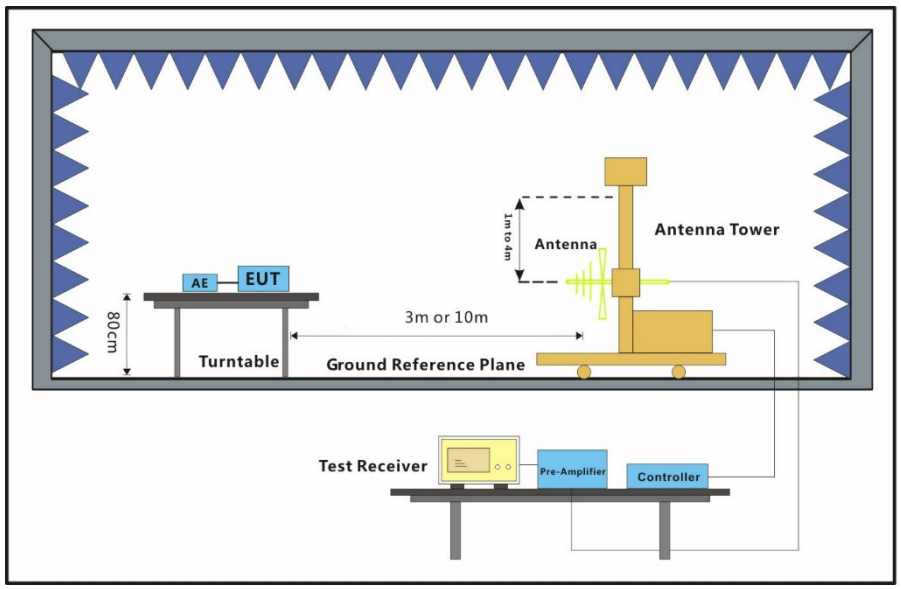
6.2.1 E.U.T. Operation

Operating Environment:
Temperature: 25.5 °C Humidity: 56.5 % RH Atmospheric Pressure: 1015 mbar

6.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Pre-scan	00	Charging BOX charge mode_Keep the EUT charging
Final test	01	Charging BOX+earphone charge mode_Keep the EUT charging
Pre-scan	02	Charging earphone mode_Keep the EUT charging

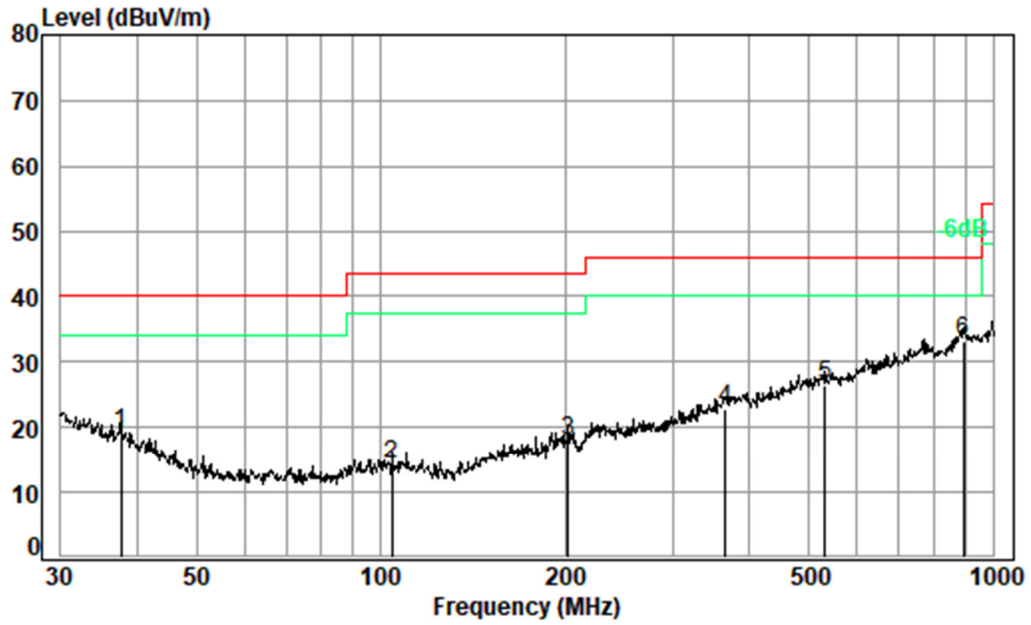
6.2.3 Test Setup Diagram



6.2.4 Measurement Procedure and Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.

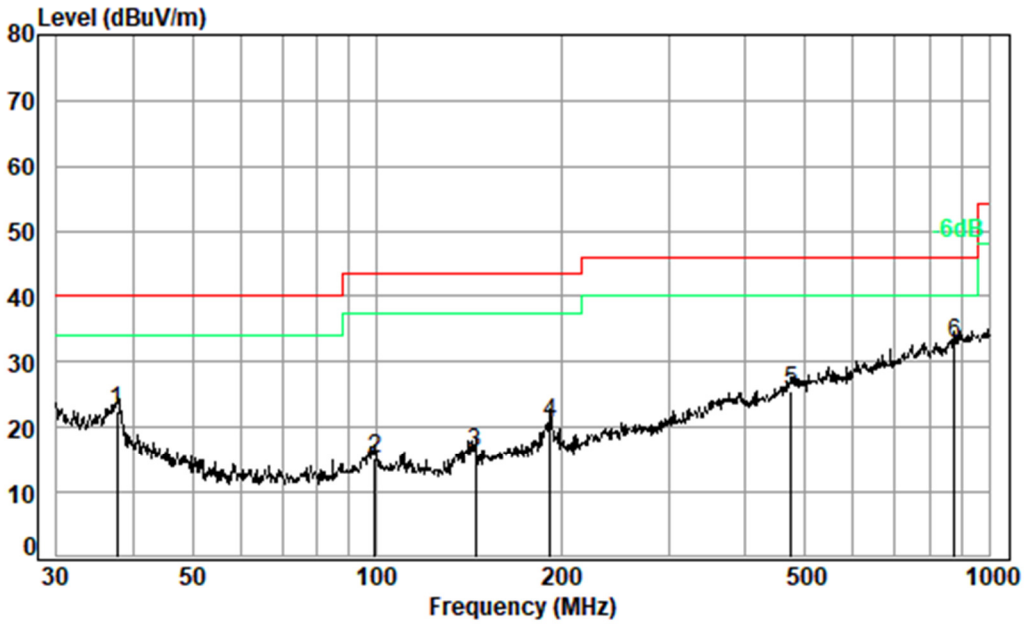
Test Mode: 01; Polarity: Horizontal



Condition: 3m HORIZONTAL
Job No. : 10288CR
Test Mode: 01

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	37.68	0.68	19.28	27.71	26.83	19.08	40.00	-20.92	QP
2	104.17	1.11	13.87	27.58	26.81	14.21	43.50	-29.29	QP
3	202.10	1.22	15.69	27.14	28.20	17.97	43.50	-25.53	QP
4	365.54	2.21	21.98	27.23	25.74	22.70	46.00	-23.30	QP
5	531.96	2.57	24.76	27.91	27.16	26.58	46.00	-19.42	QP
6 pp	893.86	3.49	28.96	27.20	27.98	33.23	46.00	-12.77	QP

Test Mode: 01; Polarity: Vertical



Condition: 3m VERTICAL
Job No. : 10288CR
Test Mode: 01

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	37.68	0.68	19.28	27.71	30.31	22.56	40.00	-17.44	QP
2	99.18	1.12	13.92	27.61	27.80	15.23	43.50	-28.27	QP
3	144.84	1.15	14.04	27.36	28.37	16.20	43.50	-27.30	QP
4	191.75	1.19	15.55	27.17	31.16	20.73	43.50	-22.77	QP
5	475.50	2.45	23.99	27.71	26.89	25.62	46.00	-20.38	QP
6 pp	878.32	3.46	29.04	27.28	27.60	32.82	46.00	-13.18	QP

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7 Test Setup Photo

Please refer to setup photos.

8 EUT Constructional Details (EUT Photos)

Refer to external and internal photos.

- End of the Report -

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