



TEST REPORT

Application No.: SZEM2010010538CR
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: 2020-08-10
Date of Test: 2020-08-18 to 2020-08-24
Date of Issue: 2020-11-19

Test Result:	Pass*
---------------------	--------------

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

Keny Xu

Keny Xu
EMC Laboratory Manager

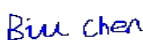



SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch, EMC Laboratory

Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.
Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

No.1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, China 518057 t (86-755) 26012053 f (86-755) 26710594 www.sgsgroup.com.cn
中国·深圳·科技园中区M-10栋一号厂房 邮编: 518057 t (86-755) 26012053 f (86-755) 26710594 sgs.china@sgs.com

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2020-11-19		Original

Authorized for issue by:			
			
		<hr/> Bill Chen/Project Engineer	
			
		<hr/> 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:

Shenzhen sunynn Technology Co., Ltd.

Jiangxi Risound Electronics Co., Ltd.

Hunan sunynn Technology Co., Ltd.

Shenzhen Sunwinon Electronics Co., Ltd.

Address of Factory:

201, building C, Xinxing Industrial Park, no. 3151 Shahe West Road, Shuguang Community, Xili Street, Nanshan District, Shenzhen City

No.271, Innovation Avenue, Jinggangshan Economic and Technological Development Zone, Ji'an City, Jiangxi Province.

Building 3 and Building 4, Intelligent Home Appliance Industrial Park, Ningxiang Economic and Technological Development Zone, Changsha, Hunan

Floor 1-6 of 4# Building 101, No. 6-6, Yanshan avenue, Yanchuan community, Yanluo street, Bao'an district, Shenzhen 518108, P.R. China.



3 Contents

	Page
1 COVER PAGE	1
2 TEST SUMMARY	3
3 CONTENTS	4
4 GENERAL INFORMATION	5
4.1 DETAILS OF E.U.T.	5
4.2 CABLE	5
4.3 DESCRIPTION OF SUPPORT UNITS	5
4.4 MEASUREMENT UNCERTAINTY	5
4.5 TEST LOCATION	6
4.6 TEST FACILITY	6
4.7 DEVIATION FROM STANDARDS	6
4.8 ABNORMALITIES FROM STANDARD CONDITIONS	6
5 EQUIPMENT LIST	7
6 EMISSION TEST RESULTS	8
6.1 CONDUCTED EMISSIONS AT MAINS TERMINALS (150kHz-30MHz)	8
6.1.1 E.U.T. Operation	8
6.1.2 Test Mode Description	8
6.1.3 Test Setup Diagram	8
6.1.4 Measurement Procedure and Data	8
6.2 RADIATED EMISSIONS (30MHz-1GHz)	13
6.2.1 E.U.T. Operation	13
6.2.2 Test Mode Description	13
6.2.3 Test Setup Diagram	13
6.2.4 Measurement Procedure and Data	13
7 TEST SETUP PHOTO	16
8 EUT CONSTRUCTIONAL DETAILS (EUT PHOTOS)	16



4 General Information

4.1 Details of E.U.T.

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

4.2 Cable

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

4.3 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Adapter	Apple	A1357 W010A051	REF. No.SEA0500

4.4 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Emissions at Mains Terminals (150kHz-30MHz)	$\pm 3.0\text{dB}$
Radiated Emissions (30MHz-1GHz)	$\pm 4.5\text{dB}$

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



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Document.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

No.1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, China 518057 t (86-755) 26012053 f (86-755) 26710594 www.sgs.com.cn
中国·深圳·科技园中区M-10栋一号厂房 邮编: 518057 t (86-755) 26012053 f (86-755) 26710594 sgs.china@sgs.com

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	2019-09-24	2020-09-23
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	2019-12-16	2020-12-15
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	SEM002-03	2019-09-26	2020-09-25
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2019-09-26	2020-09-25
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2019-09-26	2020-09-25
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2020-04-07	2021-04-06

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: 23 °C

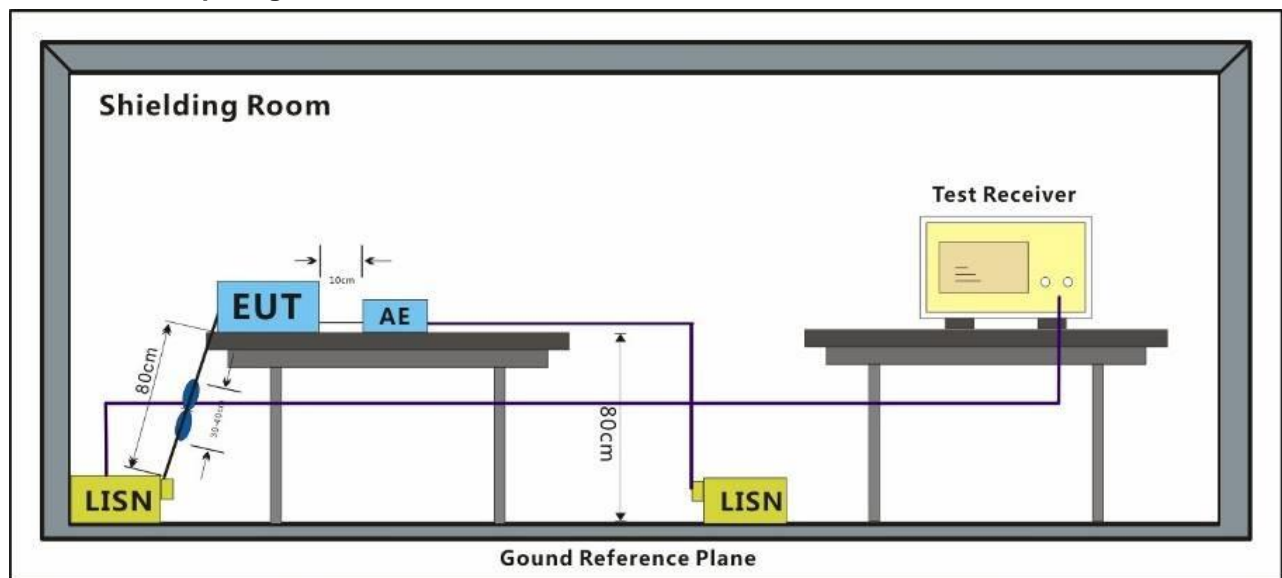
Humidity: 56 % RH

Atmospheric Pressure: 1000 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

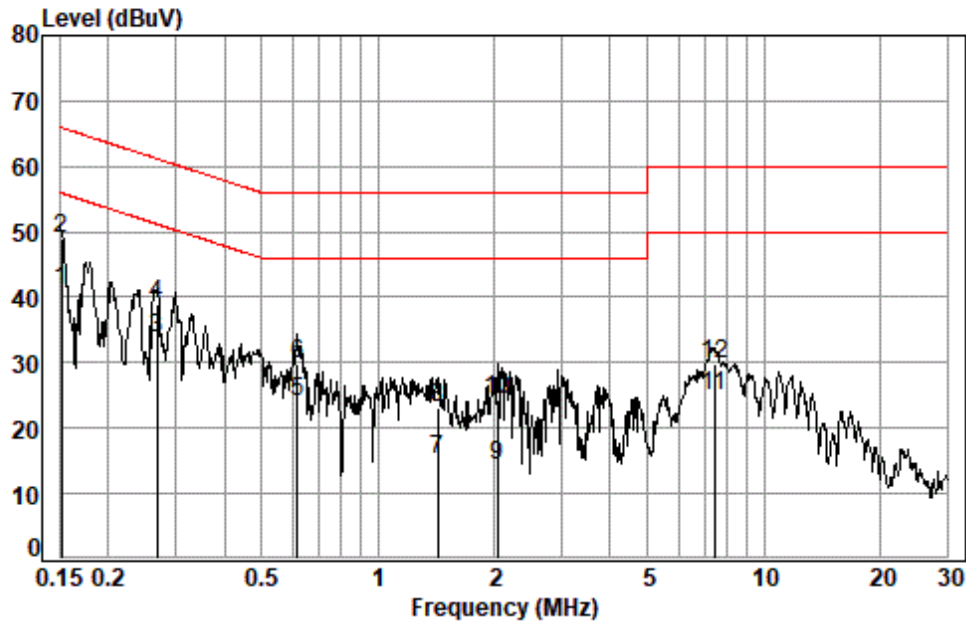
6.1.3 Test Setup Diagram



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

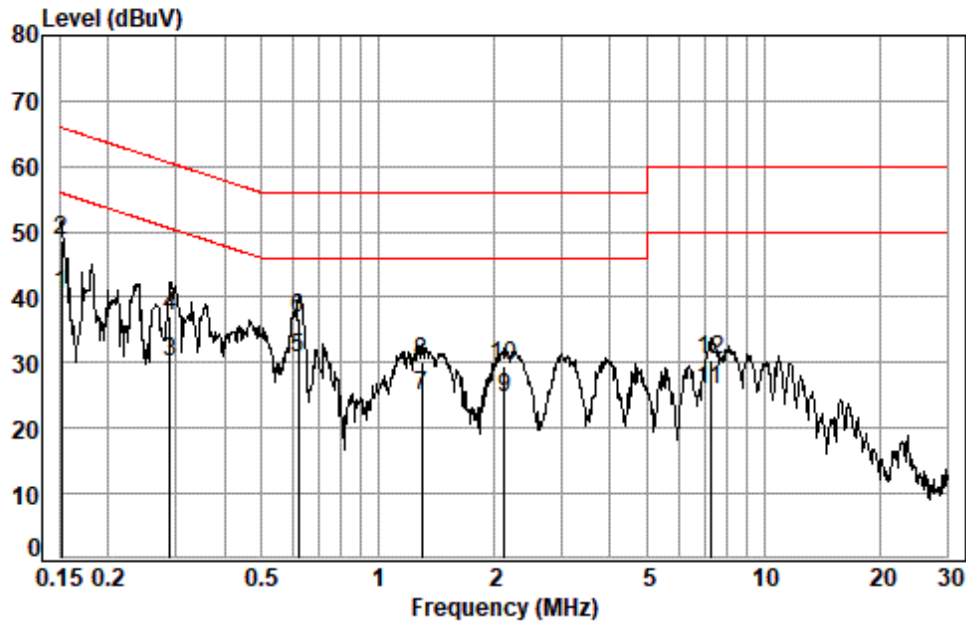


Site : Shielding Room
Condition: Line
Job No. : 10538CR
Test mode: 00

	Freq	Cable Loss	LISN Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.1516	0.01	9.68	31.38	41.07	55.91	-14.84	Average
2	0.1516	0.01	9.68	39.23	48.92	65.91	-16.99	QP
3	0.2672	0.03	9.68	24.09	33.80	51.20	-17.40	Average
4	0.2672	0.03	9.68	29.08	38.79	61.20	-22.41	QP
5	0.6173	0.07	9.69	14.34	24.10	46.00	-21.90	Average
6	0.6173	0.07	9.69	20.10	29.86	56.00	-26.14	QP
7	1.4257	0.13	9.72	5.40	15.25	46.00	-30.75	Average
8	1.4257	0.13	9.72	13.37	23.22	56.00	-32.78	QP
9	2.0441	0.16	9.75	4.52	14.43	46.00	-31.57	Average
10	2.0441	0.16	9.75	14.36	24.27	56.00	-31.73	QP
11	7.4465	0.17	9.95	14.87	24.99	50.00	-25.01	Average
12	7.4465	0.17	9.95	19.70	29.82	60.00	-30.18	QP



Test Mode: 00; Line: Neutral Line

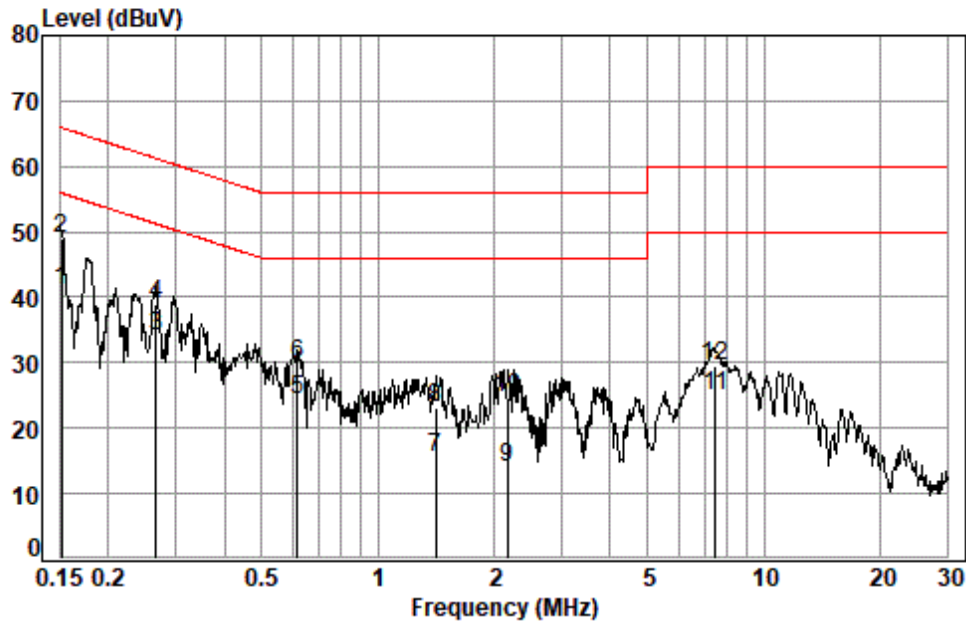


Site : Shielding Room
Condition: Neutral
Job No. : 10538CR
Test mode: 00

	Freq	Cable Loss	LISN Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.1516	0.01	9.67	30.89	40.57	55.91	-15.34	Average
2	0.1516	0.01	9.67	39.12	48.80	65.91	-17.11	QP
3	0.2893	0.04	9.67	20.34	30.05	50.54	-20.49	Average
4	0.2893	0.04	9.67	27.42	37.13	60.54	-23.41	QP
5	0.6238	0.07	9.68	20.91	30.66	46.00	-15.34	Average
6	0.6238	0.07	9.68	27.18	36.93	56.00	-19.07	QP
7	1.2960	0.12	9.70	15.07	24.89	46.00	-21.11	Average
8	1.2960	0.12	9.70	20.40	30.22	56.00	-25.78	QP
9	2.1326	0.16	9.74	14.67	24.57	46.00	-21.43	Average
10	2.1326	0.16	9.74	19.48	29.38	56.00	-26.62	QP
11	7.2518	0.17	9.99	15.65	25.81	50.00	-24.19	Average
12	7.2518	0.17	9.99	20.16	30.32	60.00	-29.68	QP



Test Mode: 01; Line: Live line

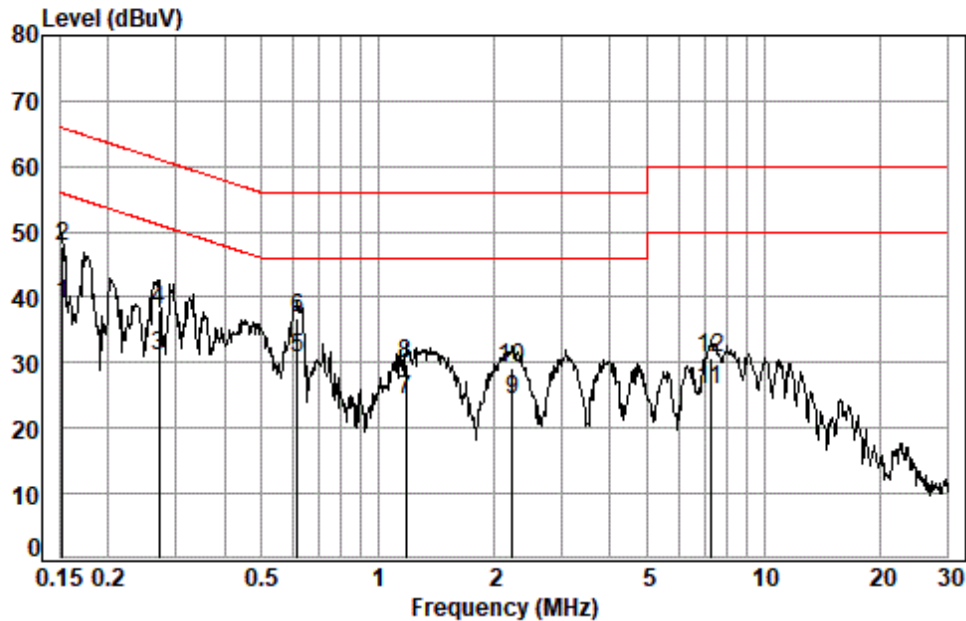


Site : Shielding Room
Condition: Line
Job No. : 10538CR
Test mode: 01

	Freq	Cable Loss	LISN Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.1516	0.01	9.68	31.34	41.03	55.91	-14.88	Average
2	0.1516	0.01	9.68	39.23	48.92	65.91	-16.99	QP
3	0.2658	0.03	9.68	24.34	34.05	51.25	-17.20	Average
4	0.2658	0.03	9.68	29.11	38.82	61.25	-22.43	QP
5	0.6173	0.07	9.69	14.45	24.21	46.00	-21.79	Average
6	0.6173	0.07	9.69	20.13	29.89	56.00	-26.11	QP
7	1.4107	0.12	9.72	5.53	15.37	46.00	-30.63	Average
8	1.4107	0.12	9.72	13.40	23.24	56.00	-32.76	QP
9	2.1668	0.16	9.76	4.09	14.01	46.00	-31.99	Average
10	2.1668	0.16	9.76	14.61	24.53	56.00	-31.47	QP
11	7.4860	0.17	9.95	14.68	24.80	50.00	-25.20	Average
12	7.4860	0.17	9.95	19.50	29.62	60.00	-30.38	QP



Test Mode: 01; Line: Neutral Line



Site : Shielding Room
Condition: Neutral
Job No. : 10538CR
Test mode: 01

	Freq	Cable Loss	LISN Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.1524	0.01	9.67	29.19	38.87	55.87	-17.00	Average
2	0.1524	0.01	9.67	38.05	47.73	65.87	-18.14	QP
3	0.2715	0.03	9.66	21.49	31.18	51.07	-19.89	Average
4	0.2715	0.03	9.66	28.45	38.14	61.07	-22.93	QP
5	0.6173	0.07	9.68	21.06	30.81	46.00	-15.19	Average
6	0.6173	0.07	9.68	27.01	36.76	56.00	-19.24	QP
7	1.1844	0.11	9.70	14.49	24.30	46.00	-21.70	Average
8	1.1844	0.11	9.70	19.93	29.74	56.00	-26.26	QP
9	2.2249	0.16	9.74	14.49	24.39	46.00	-21.61	Average
10	2.2249	0.16	9.74	19.36	29.26	56.00	-26.74	QP
11	7.2903	0.17	10.00	15.69	25.86	50.00	-24.14	Average
12	7.2903	0.17	10.00	20.53	30.70	60.00	-29.30	QP



6.2 Radiated Emissions (30MHz-1GHz)

Test Requirement: 47 CFR Part 15, Subpart B

Test Method: ANSI C63.4:2014

6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C

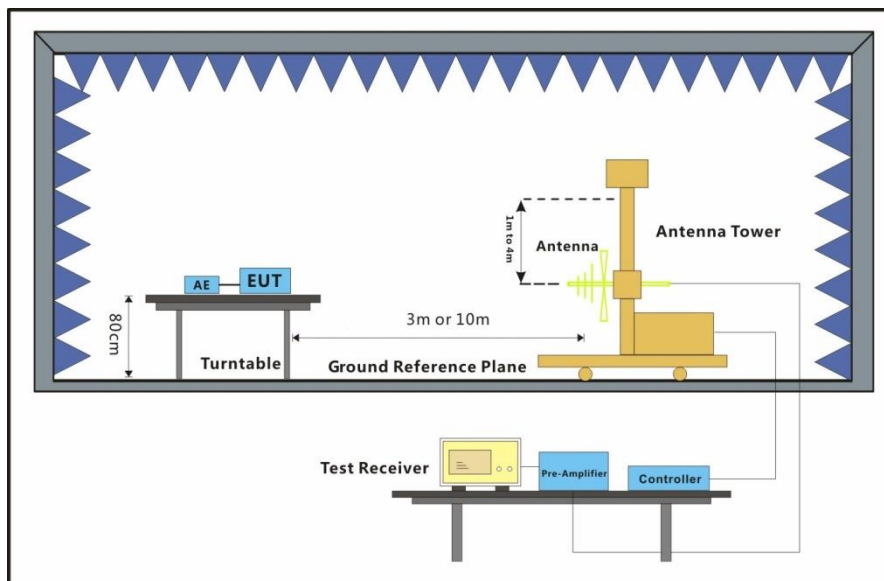
Humidity: 51 % RH

Atmospheric Pressure: 1000 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

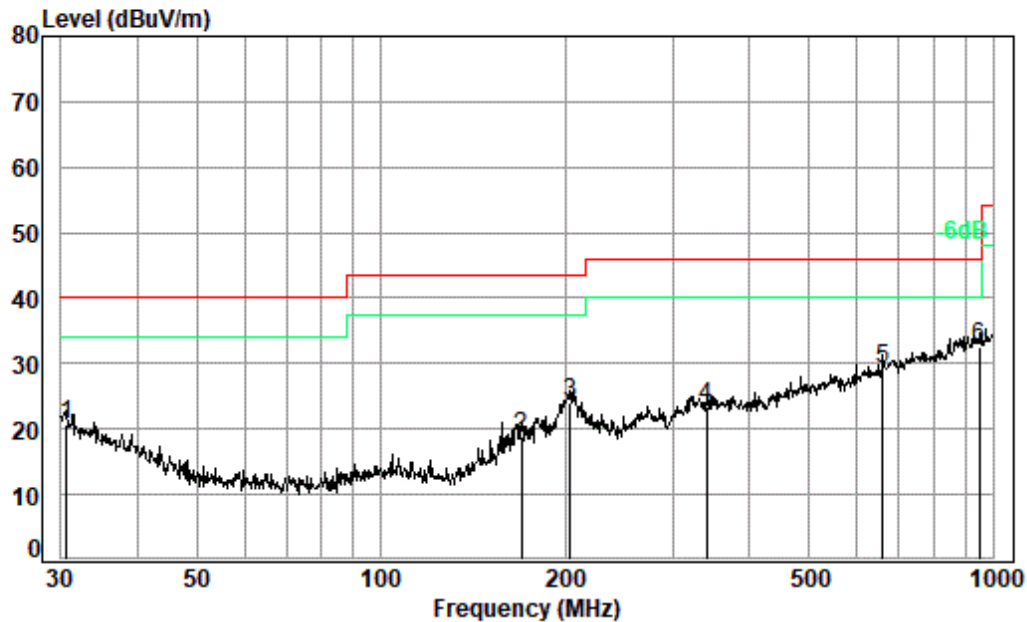
6.2.3 Test Setup Diagram



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

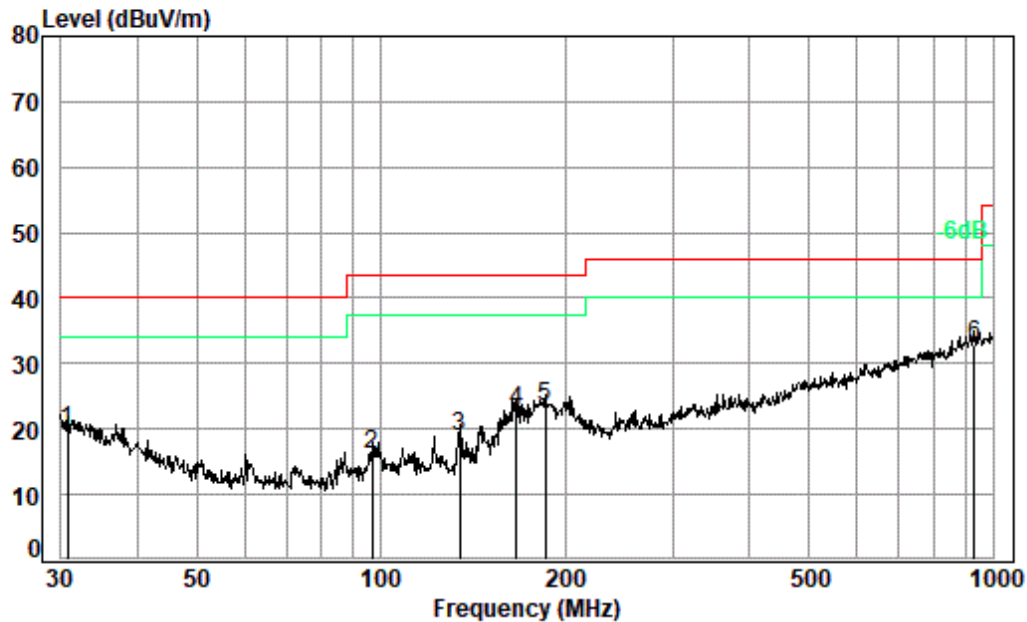
Job No. : 10538CR

Test Mode: 01

	Cable	Ant	Preamp	Read	Limit	Over	
Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	30.64	0.61	22.51	27.73	25.43	20.82	40.00 -19.18 QP
2	169.60	1.18	15.59	27.25	29.45	18.97	43.50 -24.53 QP
3	203.52	1.23	15.62	27.13	34.21	23.93	43.50 -19.57 QP
4	340.78	2.13	20.45	27.10	27.81	23.29	46.00 -22.71 QP
5	661.15	2.83	26.83	28.00	27.59	29.25	46.00 -16.75 QP
6 pp	948.76	3.55	29.33	26.91	26.57	32.54	46.00 -13.46 QP



Test Mode: 01; Polarity: Vertical



Condition: 3m VERTICAL

Job No. : 10538CR

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	30.75	0.61	22.43	27.73	24.55	19.86	40.00	-20.14	QP
2	96.77	1.16	13.80	27.61	28.67	16.02	43.50	-27.48	QP
3	134.56	1.14	12.92	27.41	32.09	18.74	43.50	-24.76	QP
4	166.65	1.17	15.53	27.27	33.29	22.72	43.50	-20.78	QP
5	185.79	1.19	15.46	27.19	33.89	23.35	43.50	-20.15	QP
6 pp	932.27	3.53	29.20	27.00	27.17	32.90	46.00	-13.10	QP



7 Test Setup Photo

Please refer to setup photos.

8 EUT Constructional Details (EUT Photos)

Please Refer to external and internal photos for details.

- End of the Report -

