



TEST REPORT

APPLICANT : OnePlus Technology (Shenzhen) Co., Ltd.

PRODUCT NAME : OnePlus Pad

MODEL NAME : OPD2203

BRAND NAME : ONEPLUS

FCC ID : 2ABZ2-OPD2203

STANDARD(S) : 47 CFR Part 15 Subpart C

RECEIPT DATE : 2023-02-23

TEST DATE : 2023-03-01 to 2023-04-14

ISSUE DATE : 2023-04-19

Edited by: Chen Bilian
Chen Bilian(Rapporteur)

Approved by: Xiao Xiong
Xiao Xiong(Supervisor)

NOTE: This document is issued by Shenzhen Morlab Communications Technology Co., Ltd., the test report shall not be reproduced except in full without prior written permission of the company. The test results apply only to the particular sample(s) tested and to the specific tests carried out which is available on request for validation and information confirmed at our website.





DIRECTORY

- 1. Technical Information..... 3**
- 1.1. Applicant and Manufacturer Information 3**
- 1.2. Equipment Under Test (EUT) Description 3**
- 2. Test Results..... 5**
- 2.1. Applied Reference Documents..... 5**
- 2.2. EUT Setup and Operating Conditions 6**
- 3. 47 CFR Part 15C Requirements 7**
- 3.1. Conducted Emission 7**
- 3.2. Radiated Emission 11**
- 3.3. 20dB Bandwidth 19**
- Annex A Test Uncertainty 21**
- Annex B Testing Laboratory Information 22**

Change History		
Version	Date	Reason for change
1.0	2023-04-19	First edition



1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	OnePlus Technology (Shenzhen) Co., Ltd.
Applicant Address:	18C02, 18C03, 18C04, and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen, Guangdong, P.R. China
Manufacturer:	OnePlus Technology (Shenzhen) Co., Ltd.
Manufacturer Address:	18C02, 18C03, 18C04, and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen, Guangdong, P.R. China

1.2. Equipment Under Test (EUT) Description

Product Name:	OnePlus Pad	
EUT No.:	1#	
Hardware Version:	98110_1_11	
Software Version:	OPD2203_13.1	
Frequency Range:	110KHz~148.5KHz	
Accessory:	AC Adapter	
	Brand Name:	SUPERVOOC
	Model No.:	VCB8JAUH
	Serial No.:	(N/A, marked #1 by test site)
	Rated Input:	100-130 V, 200-240 V~50/60Hz, 2A
	Rated Output:	5V=2A or 5-11V=6.1A Max 5V=2A or 5-11V=7.3A Max
	Manufacturer:	Huizhou Golden Lake Industrial Co.,Ltd.
	Battery	
	Brand Name:	SUPERVOOC
	Model No.:	BLT007
	Serial No.:	(N/A, marked #1 by test site)
	Capacity:	Typical: 9510mAh, Rated: 9230mAh
	Rated Voltage:	3.89V
	Charge Limit:	4.48V



	Manufacturer:	SUNWODA Electronic Co., Ltd.
	USB Cable	
	Model:	DL129

Note:

1. For a more detailed description, please refer to specification or user's manual supplied by the applicant and/or manufacturer.

2. Test Results

2.1. Applied Reference Documents

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart C (110kHz ~ 205kHz Band) for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 15	Radio Frequency Devices

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Test Date	Test Engineer	Result	Method determination Remark
1	15.203	Antenna Requirement	N/A	N/A	N/A ^{Note 1}	No deviation
2	15.207	Conducted Emission	2023.03.01	Wu Zhaoling	PASS	No deviation
3	15.209	Radiated Emission	2023.04.14	Yang Lian	PASS	No deviation
4	15.215(c)	20dB Bandwidth	2023.04.14	Gao Jianrou	PASS	No deviation

Note 1: The test item is not applicable.

Note 2: The tests were performed according to the method of measurements prescribed in ANSIC63.10-2013.

Note 3: Additions to, deviation, or exclusions from the method shall be judged in the "method determination" column of add, deviate or exclude from the specific method shall be explained in the "Remark" of the above table.

Note 4: When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% confidence intervals.



2.2. EUT Setup and Operating Conditions

Test Mode	
Mode 1	: EUT + AC Adapter + Battery + USB Cable(Charging from Adapter) + Pencil + WPC Tx

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15 - 35
Relative Humidity (%):	30 - 60
Atmospheric Pressure (kPa):	86 - 106

3. 47 CFR Part 15C Requirements

3.1. Conducted Emission

3.1.1. Requirement

According to FCC section 15.207, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 Ω line impedance stabilization network (LISN).

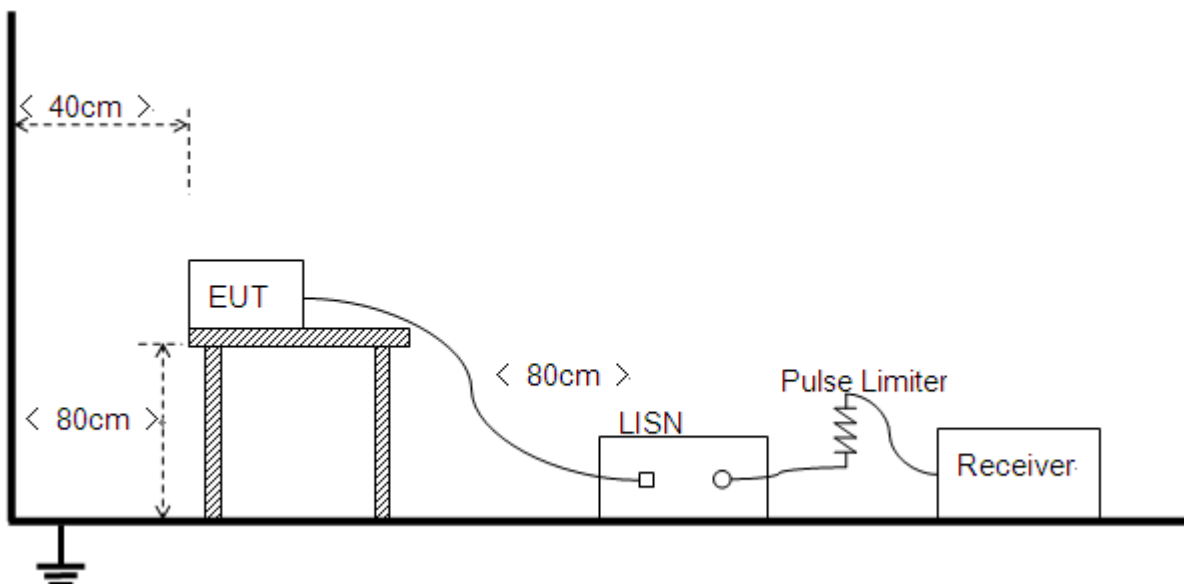
Frequency Range (MHz)	Conducted Limit (dB μ V)	
	Quasi-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

Note:

- (a) The lower limit shall apply at the band edges.
- (b) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

3.1.2. Test Description

A. Test Setup:



The Table-top EUT was placed upon a non-metallic table 0.8m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference



Ground Plane. EUT was 80cm from LISN. The set-up and test methods were according to ANSI C63.10: 2013.

B. Equipments List:

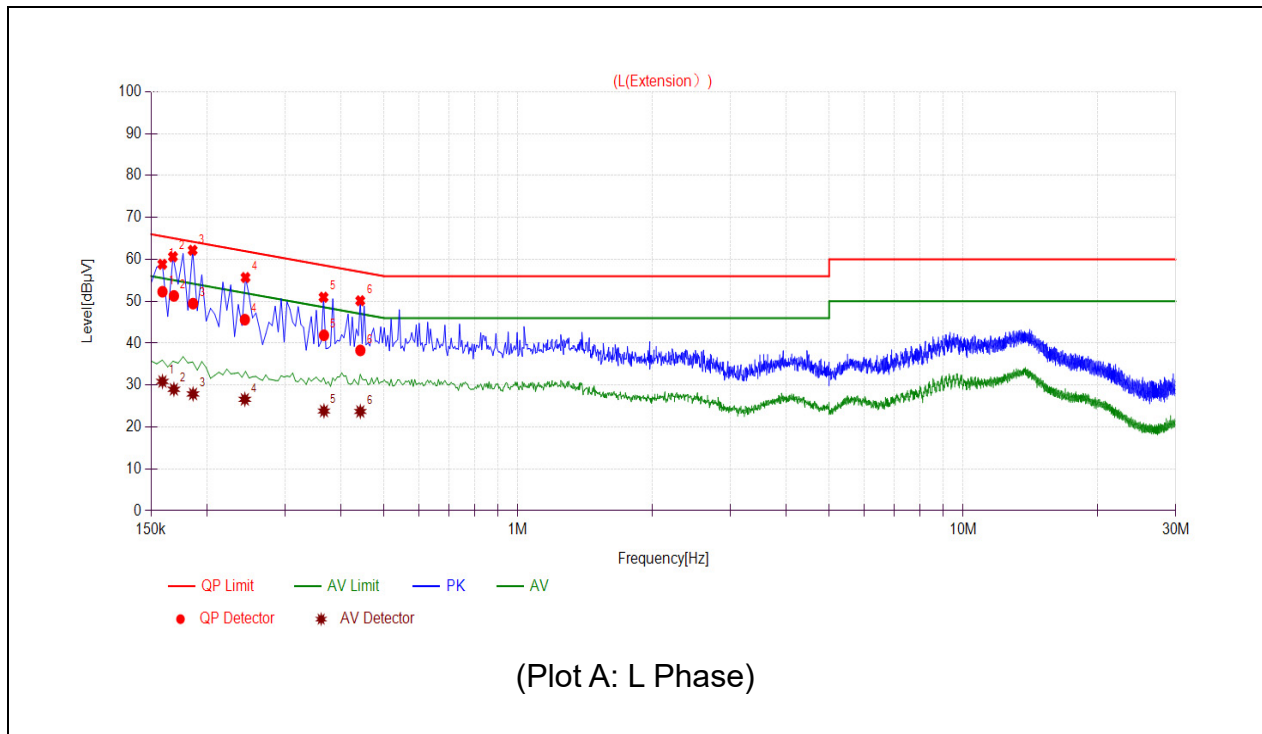
Please reference ANNEX B(5, 6).

3.1.3. Test Result

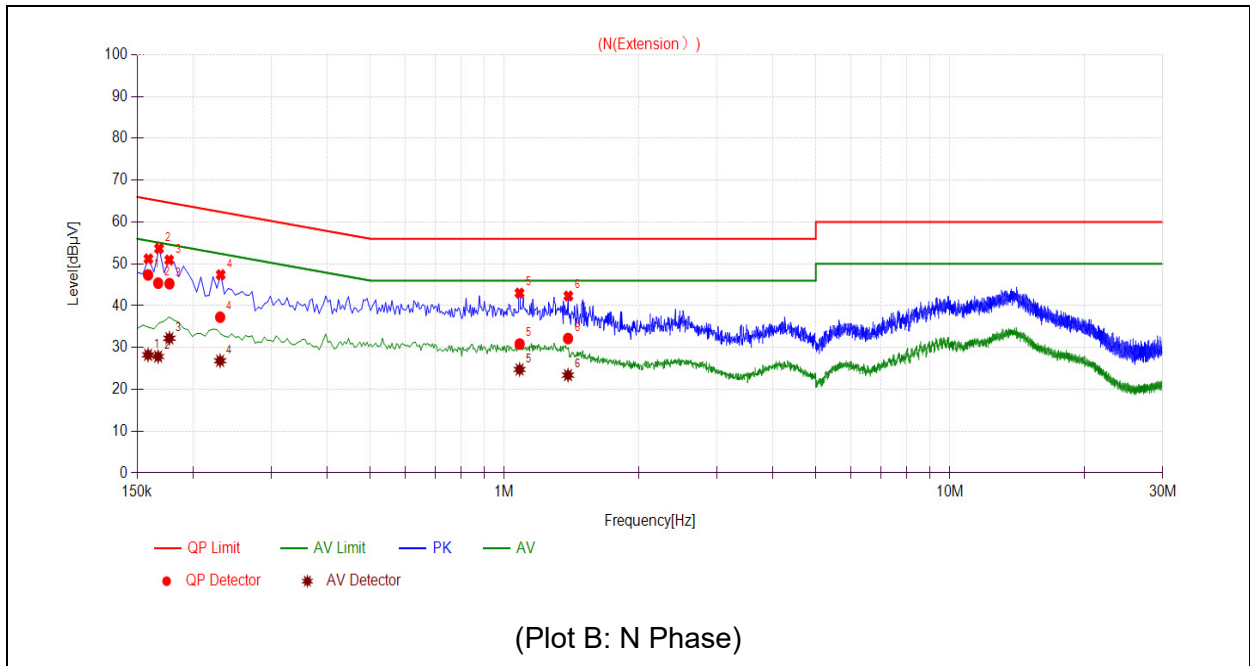
The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Set RBW=9kHz, VBW=30kHz. Refer to recorded points and plots below.

Note 1: The test voltage is AC 120V/60Hz.

A. Test Plots:



NO.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quasi-peak	Average	Quasi-peak	Average		
1	0.1591	52.28	30.85	65.51	55.51	Line	PASS
2	0.1688	51.29	28.98	65.02	55.02		PASS
3	0.1864	49.44	27.88	64.19	54.19		PASS
4	0.2436	45.62	26.59	61.97	51.97		PASS
5	0.3668	41.88	23.82	58.57	48.57		PASS
6	0.4427	38.28	23.70	57.01	47.01		PASS



NO.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quasi-peak	Average	Quasi-peak	Average		
1	0.1587	47.36	28.24	65.53	55.53	Neutral	PASS
2	0.1672	45.39	27.85	65.10	55.10		PASS
3	0.1772	45.26	32.21	64.62	54.62		PASS
4	0.2303	37.25	26.82	62.44	52.44		PASS
5	1.0820	30.84	24.75	56.00	46.00		PASS
6	1.3896	32.15	23.40	56.00	46.00		PASS



3.2. Radiated Emission

3.2.1. Requirement

According to FCC section 15.247(d), radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength ($\mu\text{V}/\text{m}$)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

Note:

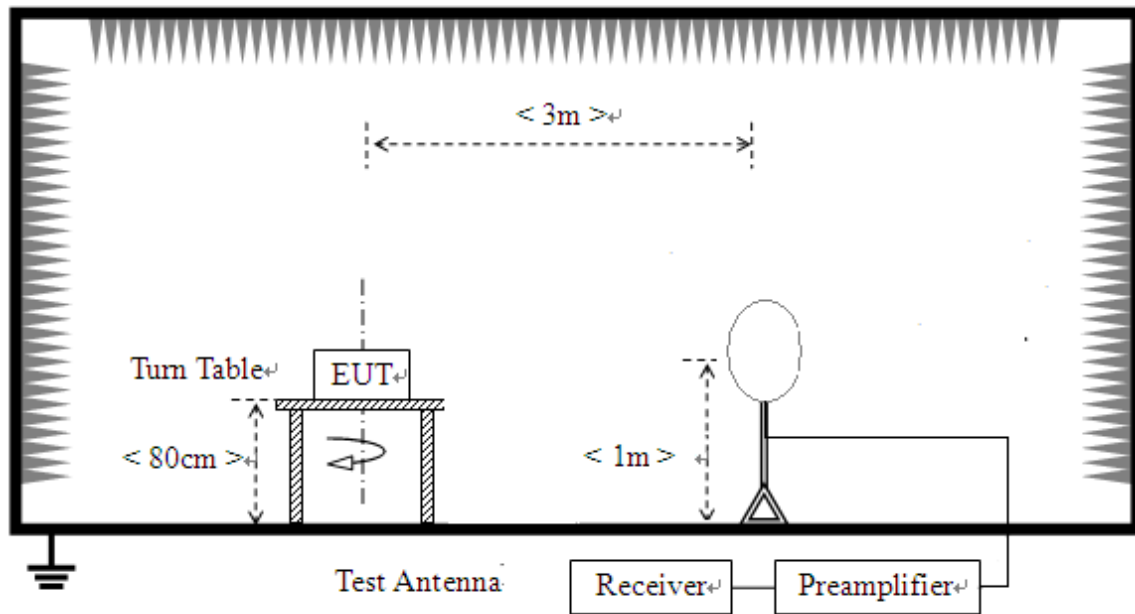
1. For Above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.
2. For above 1000MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK)

In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), also should comply with the radiated emission limits specified in Section 15.209(a)(above table)

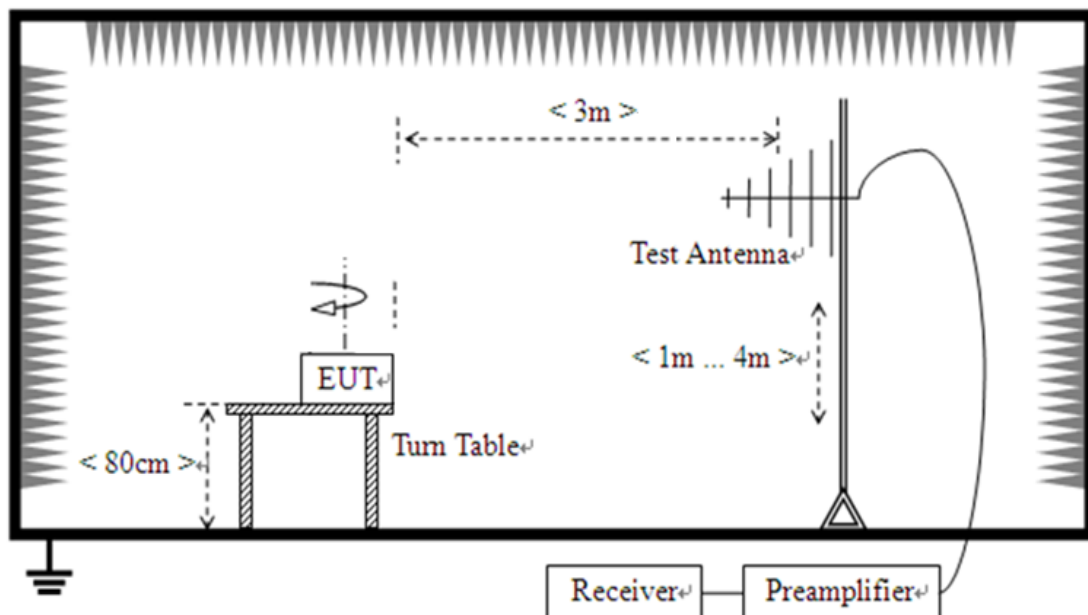
3.2.2. Test Description

A. Test Setup:

- 1) For radiated emissions from 9kHz to 30MHz



- 2) For radiated emissions from 30MHz to 1GHz





The RF absorbing material used on the reference ground plane and on the turntable have a maximum height (thickness) of 30 cm (12 in) and have a minimum-rated attenuation of 20 dB at all frequencies from 1 GHz to 18 GHz. Test site have a minimum area of the ground plane covered with RF absorbing material as specified in Figure 6 of ANSI C63.4: 2014.

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.10:2013. For radiated emissions below or equal to 1GHz, The EUT was set-up on insulator 80cm above the Ground Plane, For radiated emissions above 1GHz, The EUT was set-up on insulator 150cm above the Ground Plane. The set-up and test methods were according to ANSI C63.10:2013. The EUT is rotated through 360 degrees to maximize emissions received.

The EUT is located in a 3m Semi-Anechoic Chamber; the antenna factors, cable loss and so on of the site as factors are calculated to correct the reading. All radiated emission tests were performed in three antenna orientations (parallel, perpendicular, and ground-parallel) only the worst orientation (parallel) was recorded in this test report.

For the Test Antenna:

(a) In the frequency range of 9kHz to 30MHz, magnetic field is measured with Loop Test Antenna. The Test Antenna is positioned with its plane vertical at 1m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.

(b) In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) is used. Place the test antenna at 3m away from area of the EUT, while keeping the test antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The test antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final test antenna elevation shall be that which maximizes the emissions. The test antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane. The emission levels at both horizontal and vertical polarizations should be tested.

For measurements below 30MHz, the emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9kHz-90 kHz, 110kHz-490 kHz. Radiated emission limits in these two bands are based on measurements employing an average detector.

For measurements below 1GHz the resolution bandwidth is set to 100kHz for peak detection measurements or 120kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

**B. Equipments List:**

Please reference ANNEX B(5, 6).

3.2.3. Test Result

According to ANSI C63.10, because of peak detection will yield amplitudes equal to or greater than amplitudes measured with the quasi-peak (or average) detector, the measurement data from a spectrum analyzer peak detector will represent the worst-case results, if the peak measured value complies with the quasi-peak limit, it is unnecessary to perform a quasi-peak measurement.

The measurement results are obtained as below:

$$E [\text{dB}\mu\text{V/m}] = U_R + A_T + A_{\text{Factor}} [\text{dB}]; A_T = L_{\text{Cable loss}} [\text{dB}] - G_{\text{preamp}} [\text{dB}]$$

A_T : Total correction Factor except Antenna

U_R : Receiver Reading

G_{preamp} : Preamplifier Gain

A_{Factor} : Antenna Factor at 3m

During the test, the total correction Factor A_T and A_{Factor} were built in test software.

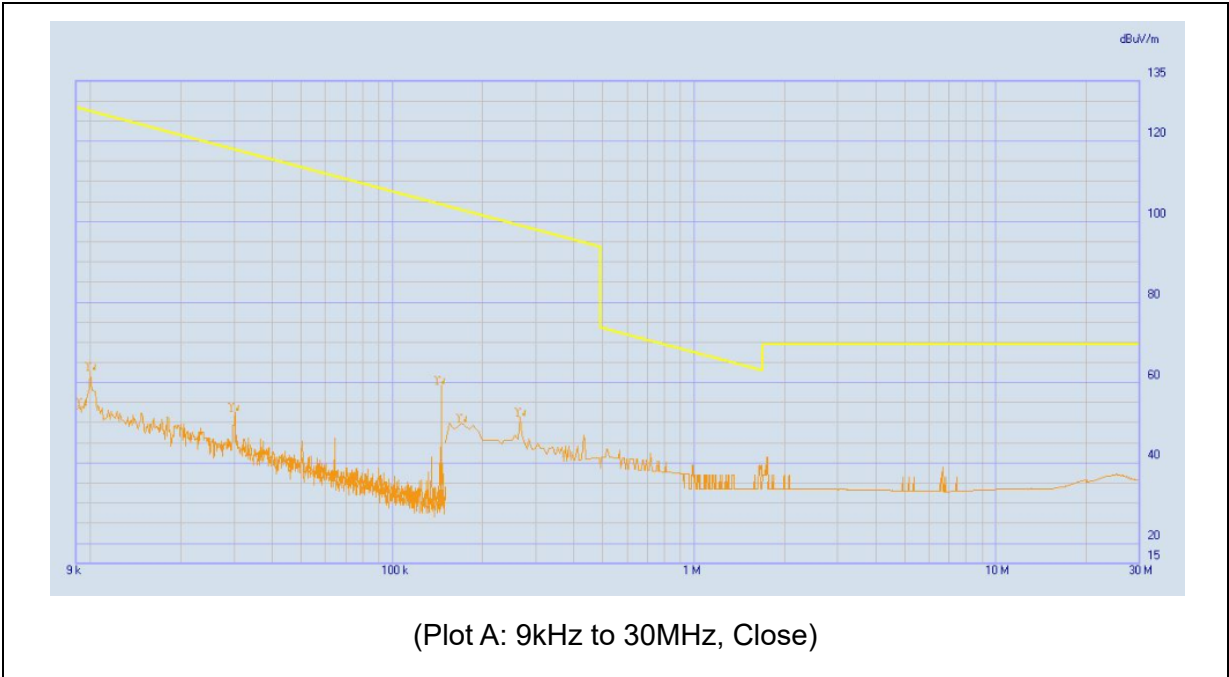
Note:

All radiated emission tests were performed in full charging mode and 10% charging mode, only the worst mode (full charging mode) was recorded in this test report. And all of the three antenna orientations (parallel, perpendicular and ground-parallel) were tested, the worst case (perpendicular) was reported

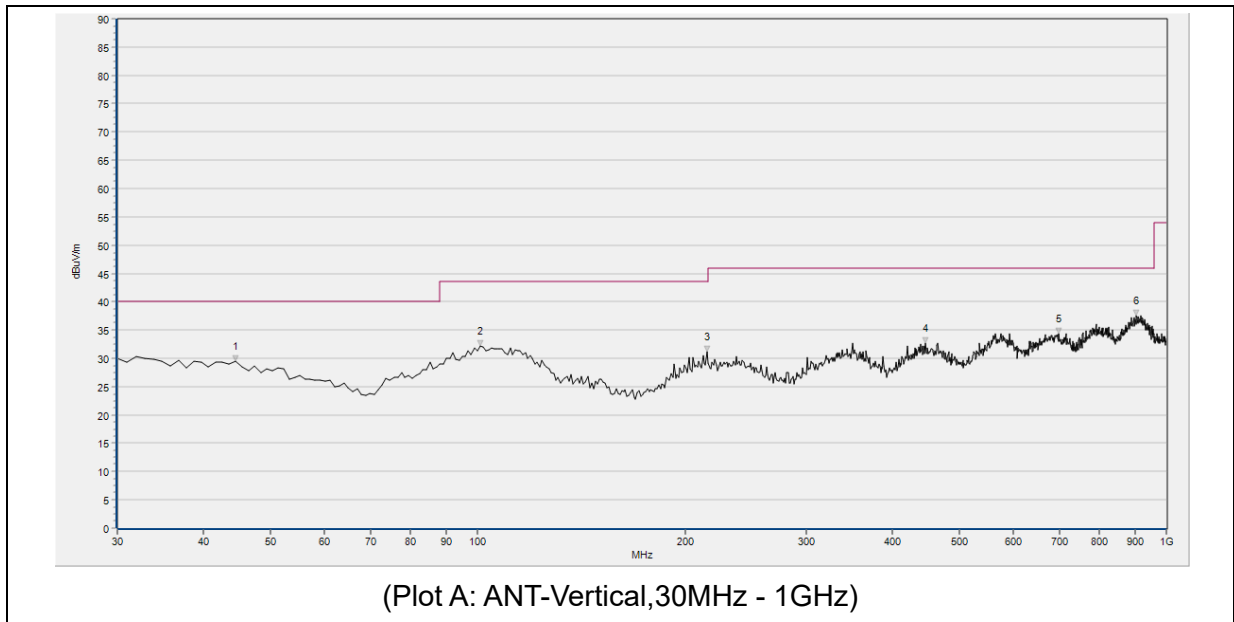
A. Test Plots for the Whole Measurement Frequency Range:



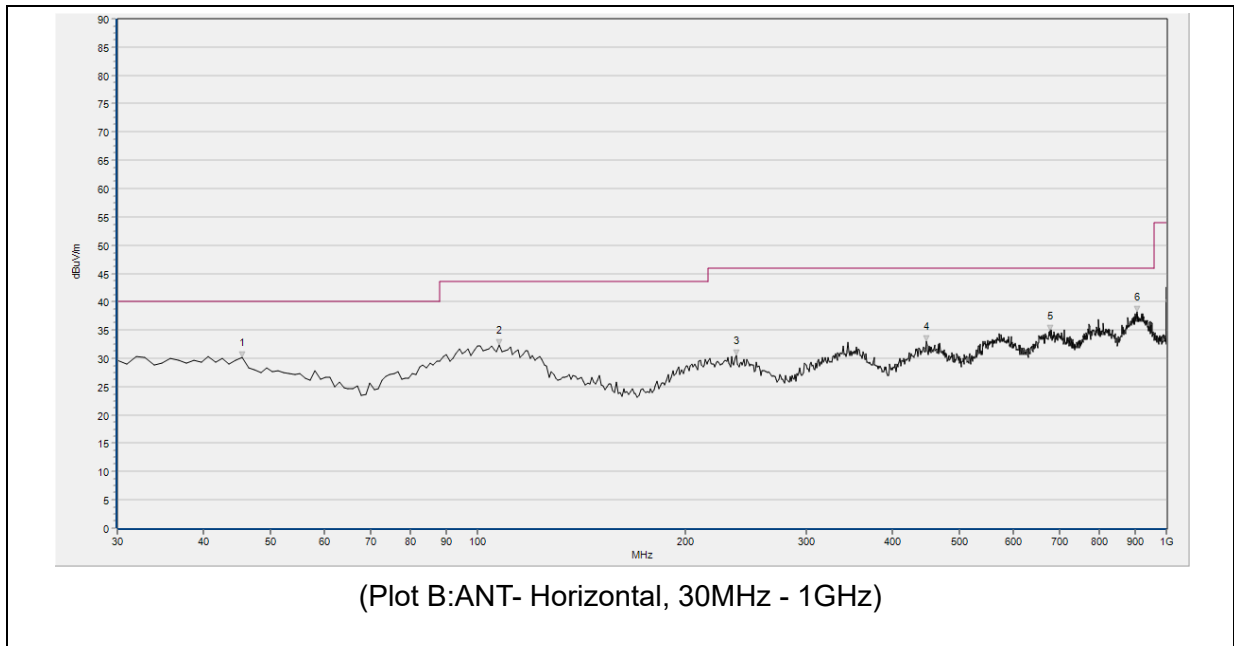
No.	Fre. (MHz)	Level(3m) (dBμV/m)	Limit(3m) (dBμV/m)	Level(300m) (dBμV/m)	Limit(300m) (dBμV/m)	Verdict
1	0.01	55.33	127.60	-24.67	47.6	PASS
2	0.0115	53.57	126.39	-26.43	46.39	PASS
3	0.142	55.22	104.56	-24.78	24.56	PASS
4	0.1441	76.85	104.43	-3.15	24.43	PASS
5	0.165	51.75	103.25	-28.25	23.25	PASS
6	0.435	57.81	94.83	-22.19	14.83	PASS



No.	Fre. (MHz)	Level(3m) (dBμV/m)	Limit(3m) (dBμV/m)	Level(300m) (dBμV/m)	Limit(300m) (dBμV/m)	Verdict
1	0.0094	53.97	128.14	-26.03	48.14	PASS
2	0.01	62.79	127.60	-17.21	47.6	PASS
3	0.03	52.53	118.06	-27.47	38.06	PASS
4	0.1441	59.25	104.43	-20.75	24.43	PASS
5	0.17	49.95	103.00	-30.05	23	PASS
6	0.265	51.31	99.14	-28.69	19.14	PASS



No.	Fre. MHz	Pk dB μ V/m	QP dB μ V/m	AV dB μ V/m	Limit-PK dB μ V/m	Limit-QP dB μ V/m	Limit-AV dB μ V/m	ANT	Verdict
1	44.550	29.49	N.A.	N.A.	N.A.	40.00	N.A.	V	PASS
2	100.810	32.25	N.A.	N.A.	N.A.	43.50	N.A.	V	PASS
3	215.270	31.19	N.A.	N.A.	N.A.	43.50	N.A.	V	PASS
4	447.100	32.68	N.A.	N.A.	N.A.	46.00	N.A.	V	PASS
6	698.330	34.30	N.A.	N.A.	N.A.	46.00	N.A.	V	PASS
7	904.940	37.47	N.A.	N.A.	N.A.	46.00	N.A.	V	PASS



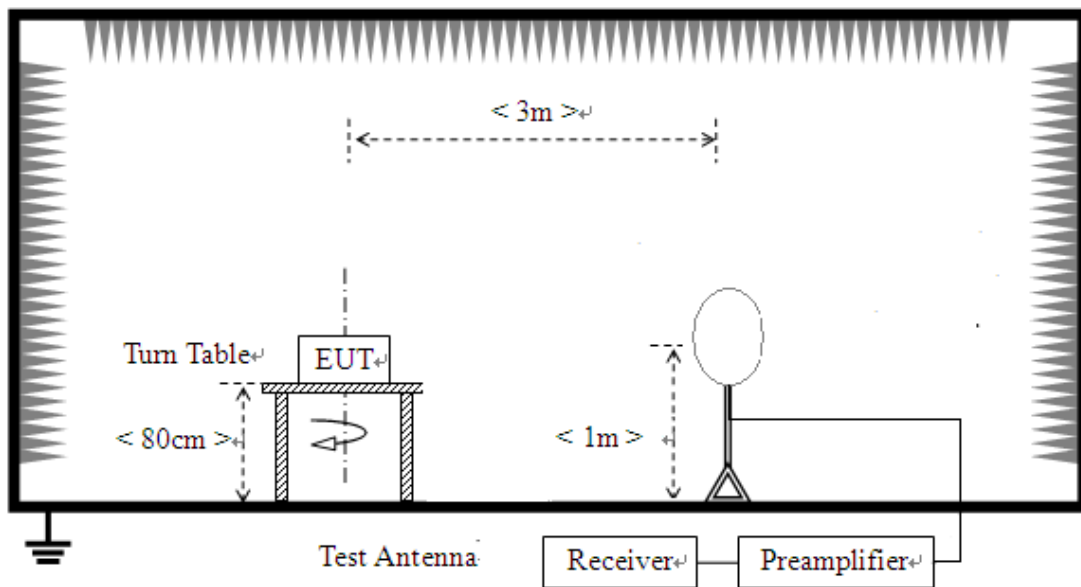
No.	Fre. MHz	Pk dBμV/m	QP dBμV/m	AV dBμV/m	Limit-PK dBμV/m	Limit-QP dBμV/m	Limit-AV dBμV/m	ANT	Verdict
1	45.520	30.12	N.A.	N.A.	N.A.	40.00	N.A.	H	PASS
2	107.600	32.32	N.A.	N.A.	N.A.	43.50	N.A.	H	PASS
3	237.580	30.46	N.A.	N.A.	N.A.	46.00	N.A.	H	PASS
4	448.070	33.02	N.A.	N.A.	N.A.	46.00	N.A.	H	PASS
5	677.960	34.93	N.A.	N.A.	N.A.	46.00	N.A.	H	PASS
6	905.910	38.20	N.A.	N.A.	N.A.	46.00	N.A.	H	PASS

3.3. 20dB Bandwidth

3.3.1. Standard Applicable

According to FCC section 15.215(c), the 20dB bandwidth should be contained within the frequency band designated in the rule section under which the EUT is operated, it was measured with a spectrum analyzer connected the EUT while the EUT is operating in transmission mode.

3.3.2. Test Setup





3.3.3. Test Result

20dB Bandwidth (kHz)	Verdict
0.424	PASS

Please refer to the following plot:





Annex A Test Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

Uncertainty of Conducted Emission Measurement

Measuring Uncertainty for a Level of Confidence of 95%(U=2Uc(y))	9kHz-150kHz	±4.1 dB
	150kHz-30MHz	±3.7dB

Uncertainty of Radiated Emission Measurement

Measuring Uncertainty for a Level of Confidence of 95%(U=2Uc(y))	9kHz-30MHz	±5.16dB
	30MHz-200MHz	±5.06dB
	200MHz-1000MHz	±5.24dB
	1GHz-6GHz	±5.18dB
	6GHz-18GHz	±5.48dB



Annex B Testing Laboratory Information

1. Identification of the Responsible Testing Laboratory

Laboratory Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Laboratory Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
Telephone:	+86 755 36698555
Facsimile:	+86 755 36698525

2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

3. Facilities and Accreditations

Accredited Testing Laboratory:	The FCC designation number is CN1192. Test firm registration number is 226174. (Shenzhen Morlab Communications Technology Co., Ltd.)
---------------------------------------	--

4. Test Software Utilized

Model	Version Number	Producer
TS+ -[JS32-RE]	Version 2.5.0.6	Tonscend
TS+ -[JS32-CE]	Version 2.5.0.0	Tonscend
MORLAB EMCR	Version V1.2	Morlab

**5. Test Equipments Utilized**

Description	Model	Serial No.	Manufacturer	Cal. Date	Due. Date
Loop Antenna	FMZB 1519B	00131	SCHWARZBECK	2022/10/25	2025/10/24
Bi-Log Antenna	VULB 9163	9163-274	SCHWARZBECK	2022/11/7	2025/11/6
Receiver	N9038A	MY541300 16	Agilent	2022/7/7	2023/7/6
Preamplifier	S020180L3203	61171/611 72	LUCIX CORP.	2022/7/8	2023/7/7
Preamplifier	S10M100L3802	46732	LUCIX CORP.	2022/7/8	2023/7/7
RF Coaxial Cable	PE330	MRE001	Pasternack	N/A	N/A
RF Coaxial Cable	CLU18	MRE002	Pasternack	N/A	N/A
RF Coaxial Cable	CLU18	MRE003	Pasternack	N/A	N/A
RF Coaxial Cable	BNC	MRE04	Qualwave	N/A	N/A
Receiver	ESPI	101052	R&S	2022/7/7	2023/7/6
LISN	NSLK 8127	8127449	Schwarzbeck	2023/2/21	2024/2/20

6. Ancillary Equipment Utilized

Description	Manufacturer	Model	Serial No.
Pencil	OPPO	N/A	N/A

————— END OF REPORT —————