TEST REPORT

APPLICANT	:	Nubia Technology Co.,Ltd
PRODUCT NAME	:	wearable phone
MODEL NAME	:	SW1002
BRAND NAME	:	NUBIA
STANDARD(S)	:	47 CFR Part 15 Subpart B
FCC ID	:	2AHJO-SW1002
RECEIPT DATE	:	2019-02-20
TEST DATE	:	2019-02-28 to 2019-03-01
ISSUE DATE	:	2019-03-18

Edited by: Lv Shangrong

Lv Shangrong(Rapporteur)

Approved by: Andy Yeh

Andy Yeh(Technical Director)

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DIRECTORY

Change History		
Version	**Date**	**Reason for change**
1.0	2019-03-18	First edition

1. Technical Information

Note: Provide by applicant

1.1. Applicant and Manufacturer Information

Applicant:	Nubia Technology Co.,Ltd
Applicant Address:	10/F, Tower A, Hans Innovation Mansion, North Ring Rd., No.9018, High-Tech Park, Nanshan District, Shenzhen, China
Manufacturer:	Nubia Technology Co.,Ltd
Manufacturer Address:	10/F, Tower A, Hans Innovation Mansion, North Ring Rd., No.9018, High-Tech Park, Nanshan District, Shenzhen, China

1.2. Equipment Under Test (EUT) Description

EUT Type:	wearable phone	
Serial No:	(N/A, marked #1 by test site)	
Hardware Version:	SW1002MB_C	
Software Version:	SW1002_ENCommon_V1.00	
Frequency Range:	Bluetooth: 2402 MHz ~ 2480 MHz 802.11b/g/n-20: 2412 MHz ~ 2462 MHz GPS: 1559 MHz ~ 1610 MHz	
Ancillary Equipment:	**Battery**	
	Brand Name:	ATL
	Model No.:	Li3905T44P6h292752
	Serial No.:	(N/A, marked #1 by test site)
	Capacity:	500mAh
	Rated Voltage:	3.85V
	Charge Limit:	4.4V
	AC Adapter	
	Brand Name:	nubia
	Model No.:	STC-A51A-Z
	Serial No.:	(N/A, marked #1 by test site)
	Rated Input:	100-240V ～ 50/60Hz 0.25A
	Rated Output:	5V⎓1A

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 B:

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
1	15.107	Conducted Emission	2019.02.28	Wu Zhongwen	PASS
2	15.109	Radiated Emission	2019.03.01	Wu Zhongwen	PASS

NOTE: The tests were performed according to the method of measurements prescribed in ANSI C63.4-2014.

2.2. EUT Setup and Operating Conditions

Test Item	
Radiated Emission	
Mode 1 :	**EUT + USB Cable + Base + Adapter + Camera + Bluetooth Idle + WIFI Idle**
Mode 2 :	EUT + USB Cable + Base + Adapter + GPS Rx + Bluetooth Idle + WIFI Idle
Mode 3 :	EUT + USB Cable + Base + Adapter + Bluetooth Rx
Mode 4 :	EUT + USB Cable + Base + Adapter + WIFI Rx
Mode 5 :	**EUT + USB Cable + PC + Bluetooth Idle + WIFI Idle (Transmitting Data)**
Conducted Emission	
Mode 1 :	**EUT + USB Cable + Base + Adapter + Camera + Bluetooth Idle + WIFI Idle**
Mode 2 :	EUT + USB Cable + Base + Adapter + GPS Rx + Bluetooth Idle + WIFI Idle
Mode 3 :	EUT + USB Cable + Base + Adapter + Bluetooth Rx
Mode 4 :	EUT + USB Cable + Base + Adapter + WIFI Rx
Mode 5 :	**EUT + USB Cable + PC + Bluetooth Idle + WIFI Idle (Transmitting Data)**
Remark: The above test modes in boldface (Mode 1, Mode 5) were the worst cases of conducted emission, radiated emission tests; only the test data of these modes were reported.	

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 15B Requirements

3.1. Conducted Emission

3.1.1. Requirement

According to FCC section 15.107, 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 50μH/50Ω line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

NOTE:

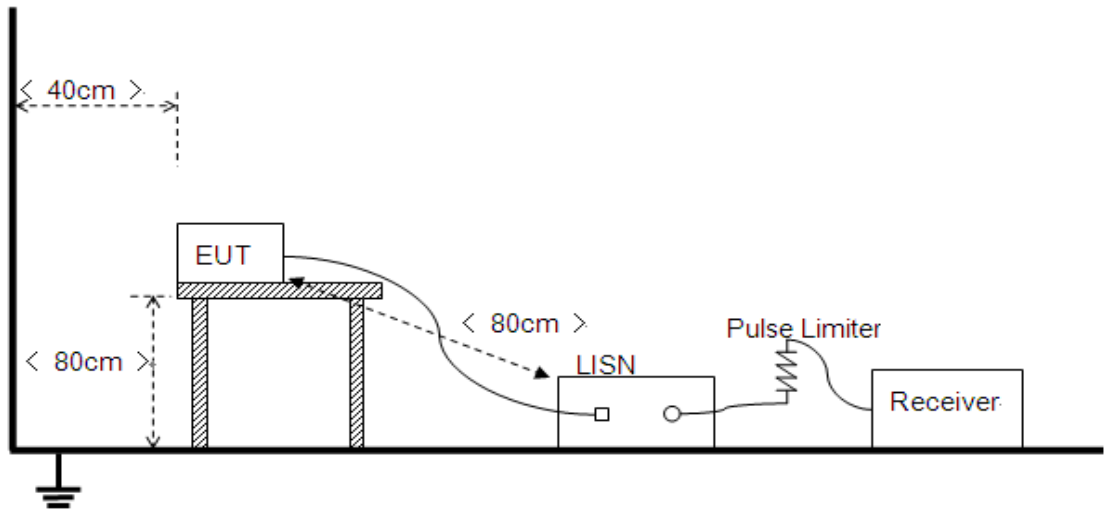
a) The limit subjects to the Class B digital device.

b) The lower limit shall apply at the band edges.

c) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

3.1.2. Test Setup

Please refer to Annex A for the photographs of the Test Configuration.



The EUT is placed on a 0.8m high insulating table, which stands on the grounded conducting floor, and keeps 0.4m away from the grounded conducting wall. The EUT is connected to the power mains through a LISN which provides 50Ω/50μH of coupling impedance for the measuring instrument. A Pulse Limiter is used to protect the measuring instrument. The factors of the whole test system are calibrated to correct the reading.

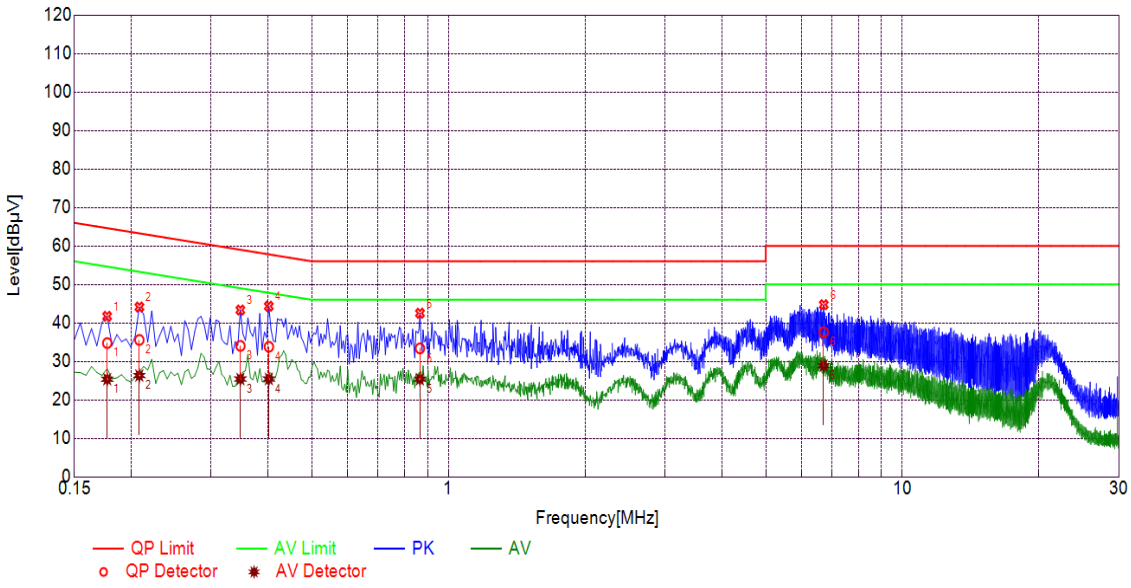
The power strip or extension cord has been investigated to make sure that the LISN integrity in maintained with respect to the impedance characteristics as prescribed in ANSI C63.4-2014 at Clause 4.3.

3.1.3. Test Result

The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; 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. All test modes are considered, refer to recorded points and plots below.

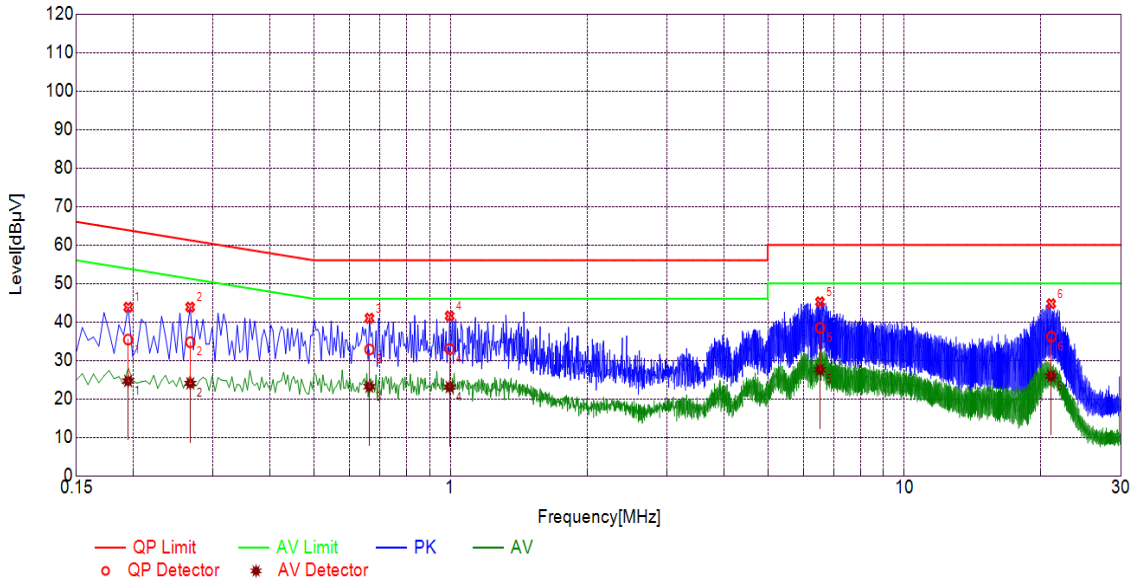
A. Test Plot and Suspicious Points:

Mode 1



(Plot A:L Phase)

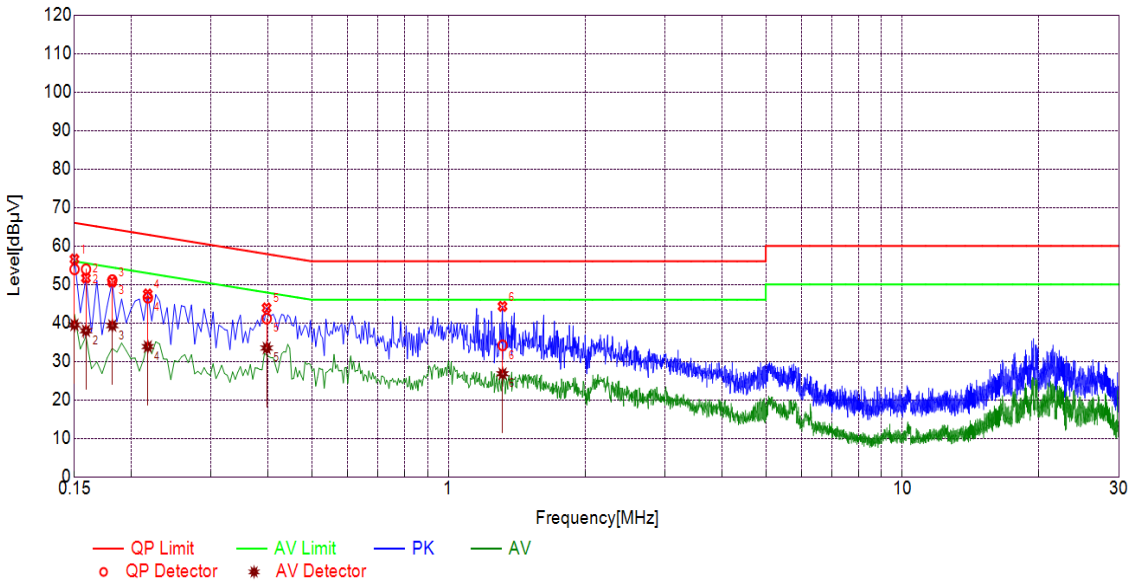
NO.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1771	34.76	25.36	64.62	54.62	Line	PASS
2	0.2084	35.58	26.33	63.27	53.27		PASS
3	0.3480	34.04	25.41	59.01	49.01		PASS
4	0.4021	33.80	25.42	57.81	47.81		PASS
5	0.8652	33.38	25.38	56.00	46.00		PASS
6	6.7073	37.58	28.87	60.00	50.00		PASS



(Plot B: N Phase)

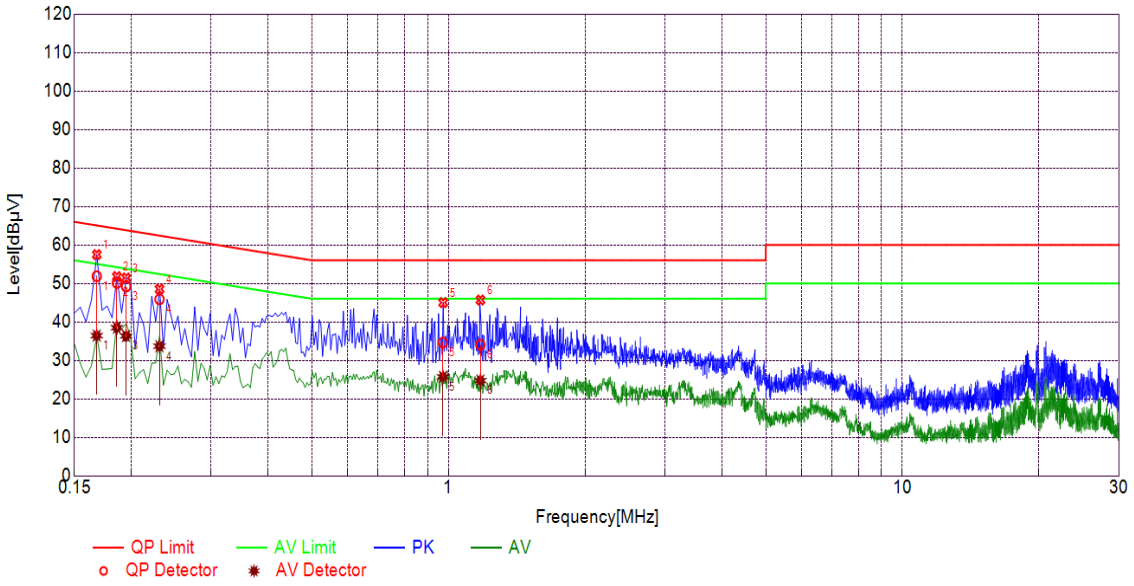
NO.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1949	35.42	24.65	63.82	53.82	Neutral	PASS
2	0.2672	34.73	24.03	61.20	51.20		PASS
3	0.6628	32.84	23.17	56.00	46.00		PASS
4	0.9955	32.97	23.07	56.00	46.00		PASS
5	6.5195	38.45	27.56	60.00	50.00		PASS
6	21.059	36.16	25.92	60.00	50.00		PASS

Mode 5



(Plot A:L Phase)

NO.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1500	53.92	39.50	66.00	56.00	Line	PASS
2	0.1590	53.94	37.97	65.52	55.52		PASS
3	0.1817	51.12	39.32	64.41	54.41		PASS
4	0.2176	46.55	33.85	62.91	52.91		PASS
5	0.3977	41.13	33.47	57.90	47.90		PASS
6	1.3157	34.17	26.79	56.00	46.00		PASS



(Plot B: N Phase)

NO.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1679	51.87	36.44	65.06	55.06	Neutral	PASS
2	0.1860	50.13	38.48	64.21	54.21		PASS
3	0.1948	49.18	36.35	63.83	53.83		PASS
4	0.2308	45.88	33.68	62.42	52.42		PASS
5	0.9726	34.65	25.72	56.00	46.00		PASS
6	1.1758	34.06	24.76	56.00	46.00		PASS

3.2. Radiated Disturbance

3.2.1. Requirement

According to FCC section 15.109 (a), the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency range (MHz)	Field Strength Limitation at 3m Measurement Dist	
	(μV/m)	(dBμV/m)
30.0 - 88.0	100	20log 100
88.0 - 216.0	150	20log 150
216.0 - 960.0	200	20log 200
Above 960.0	500	20log 500

As shown in FCC section 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector. When average radiated emission measurements are specified in this part, including emission measurements below 1000MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.

Note:

1) The tighter limit shall apply at the boundary between two frequency range.
2) Limitation expressed in dBμV/m is calculated by 20log Emission Level(μV/m).

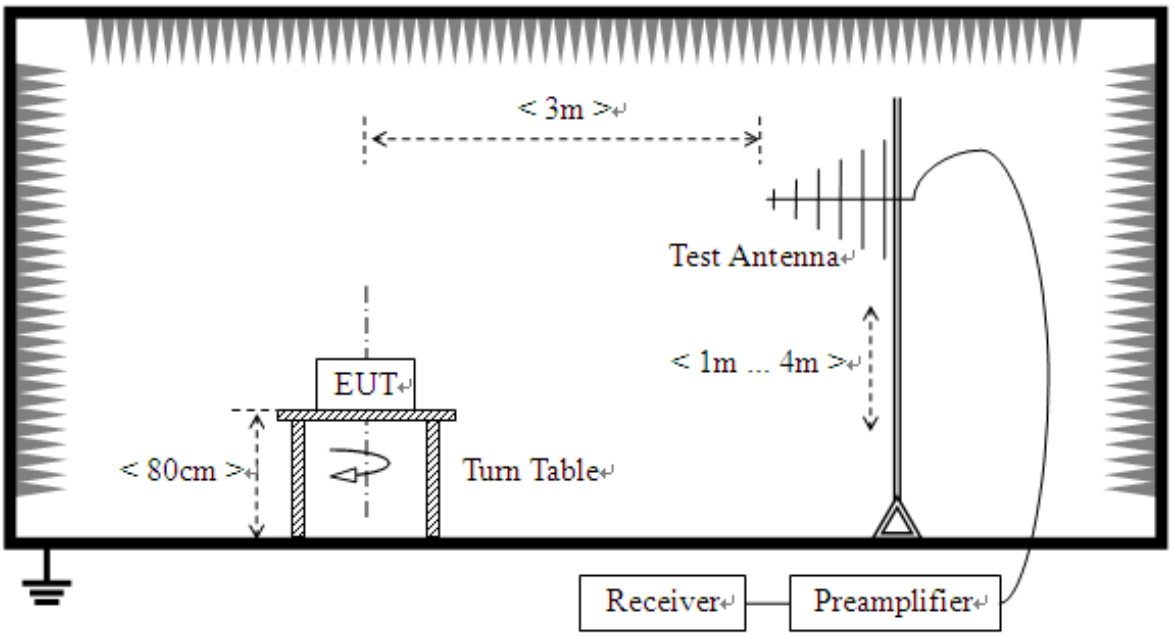
3.2.2. Frequency range of measurement

According to 15.33(b)(1), the frequency range of radiated measurement for the EUT is listed in the following table:

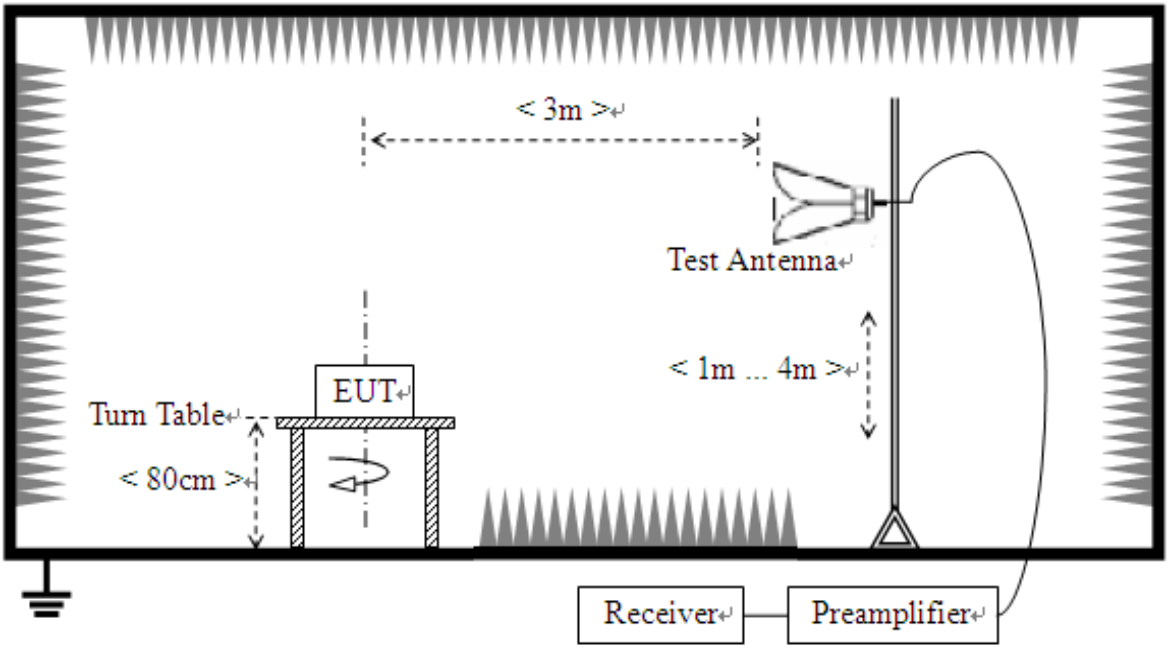
Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30.
1.705–108	1000.
108–500	2000.
500–1000	5000.
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower.

3.2.3. Test Setup

1) For radiated emissions from 30MHz to1GHz



2) For radiated emissions above 1GHz



The test is performed in a 3m Semi-Anechoic Chamber; the antenna factor, cable loss and so on of the site (factors) is calculated to correct the reading. The EUT is placed on a 0.8m high insulating Turn Table, and keeps 3m away from the Test Antenna, which is mounted onavariable-height antenna master tower.

For the test Antenna:

In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength. The emission levels at both horizontal and vertical polarizations should be tested.

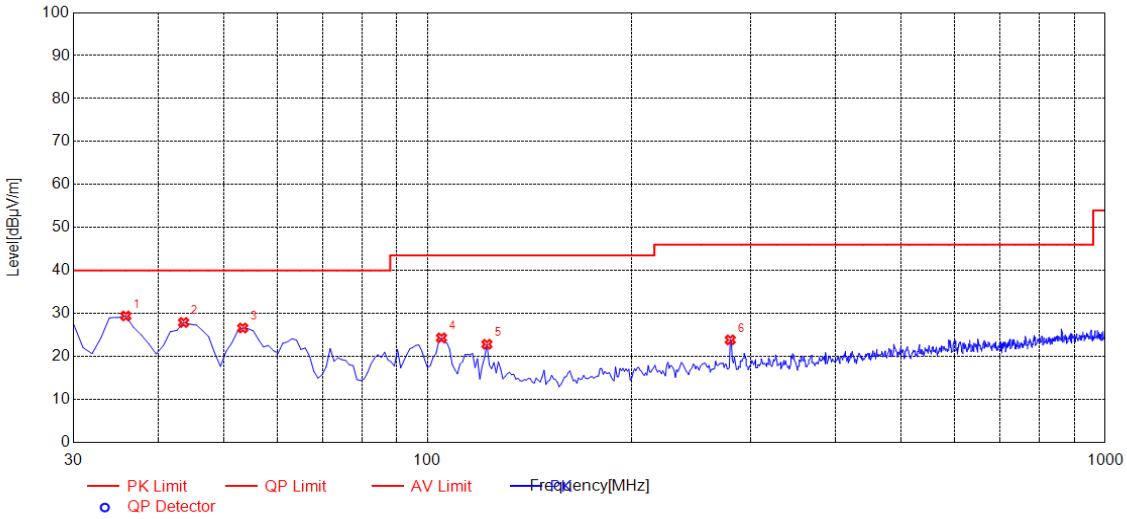
3.2.4. Test Result

The maximum radiated emission is searched using PK, QP and AV detectors; the emission levels more than the limits, and that have narrow margins from the limits will be re-measured with AV and QP detectors. Both the vertical and the horizontal polarizations of the Test Antenna are considered to perform the tests. All test modes are considered, refer to recorded points and plots below.

The amplitude of emissions which (6GHz-12.5GHz) are attenuated more than 20 dB below the permissible value need not be reported.

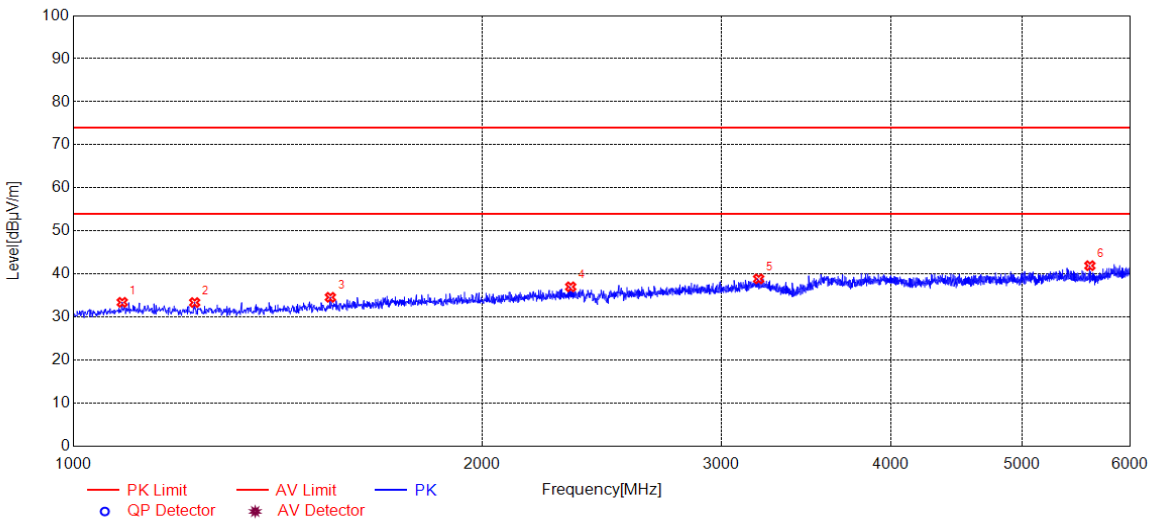
Note: All radiated emission tests were performed in X, Y, Z axis direction, and only the worst axis test condition was recorded in this test report.

Mode 1



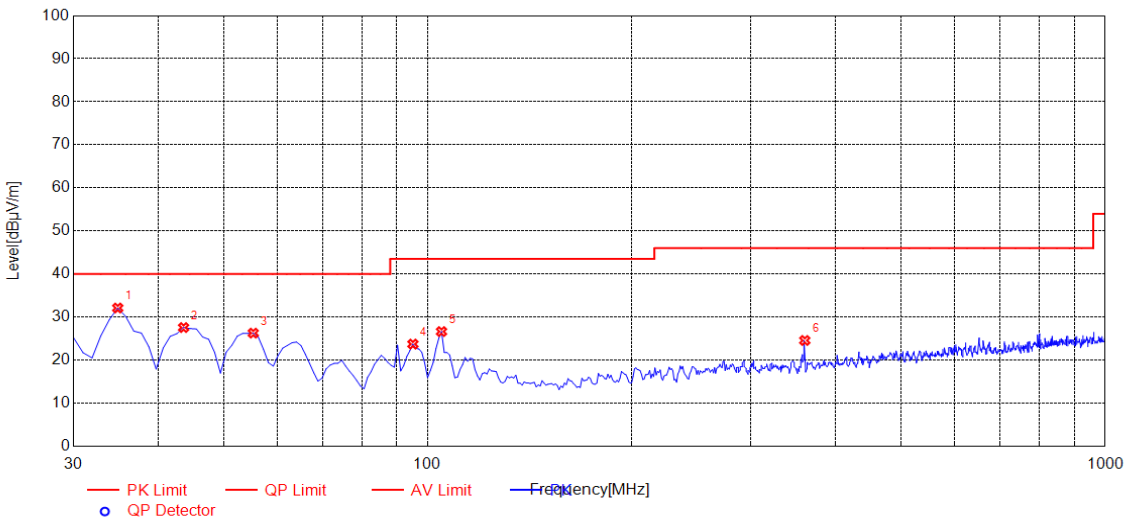
(Plot A: ANT-Vertical,30MHz - 1GHz)

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	35.8258	29.43	N.A	N.A	N.A	40.00	N.A	V	PASS
2	43.5936	27.92	N.A	N.A	N.A	40.00	N.A	V	PASS
3	53.3033	26.63	N.A	N.A	N.A	40.00	N.A	V	PASS
4	104.7648	24.35	N.A	N.A	N.A	43.50	N.A	V	PASS
5	122.2422	22.85	N.A	N.A	N.A	43.50	N.A	V	PASS
6	279.5395	23.87	N.A	N.A	N.A	46.00	N.A	V	PASS



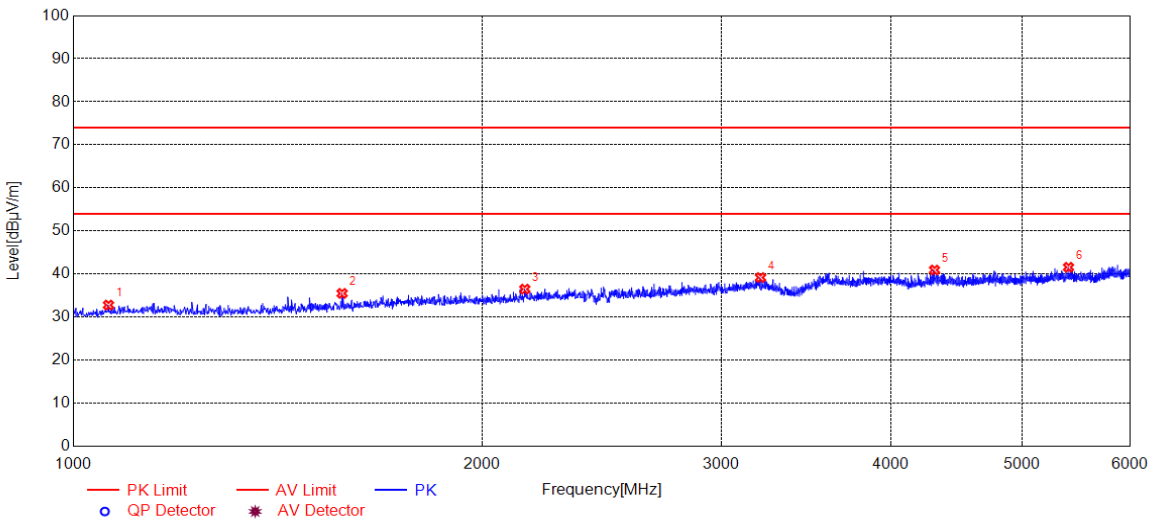
(Plot A: ANT-Vertical,1GHz - 6GHz)

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	1086.0172	33.43	N.A	N.A	74.00	N.A	54.00	V	PASS
2	1228.0456	33.38	N.A	N.A	74.00	N.A	54.00	V	PASS
3	1546.1092	34.60	N.A	N.A	74.00	N.A	54.00	V	PASS
4	2324.2649	37.03	N.A	N.A	74.00	N.A	54.00	V	PASS
5	3197.4395	38.88	N.A	N.A	74.00	N.A	54.00	V	PASS
6	5608.9218	41.94	N.A	N.A	74.00	N.A	54.00	V	PASS



(Plot B:ANT- Horizontal, 30MHz - 1GHz)

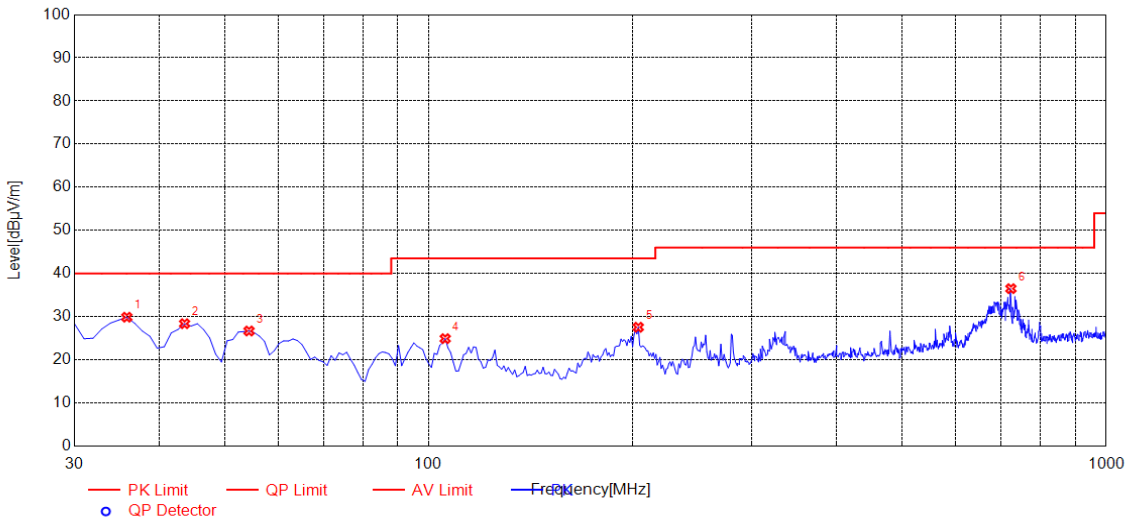
No.	Fre. MHz	Pk dBµV/m	QP dBµV/m	AV dBµV/m	Limit-PK dBµV/m	Limit-QP dBµV/m	Limit-AV dBµV/m	ANT	Verdict
1	34.8549	32.12	N.A	N.A	N.A	40.00	N.A	H	PASS
2	43.5936	27.58	N.A	N.A	N.A	40.00	N.A	H	PASS
3	55.2452	26.29	N.A	N.A	N.A	40.00	N.A	H	PASS
4	95.0551	23.74	N.A	N.A	N.A	43.50	N.A	H	PASS
5	104.7648	26.65	N.A	N.A	N.A	43.50	N.A	H	PASS
6	360.1301	24.58	N.A	N.A	N.A	46.00	N.A	H	PASS



(Plot B:ANT- Horizontal, 1GHz - 6GHz)

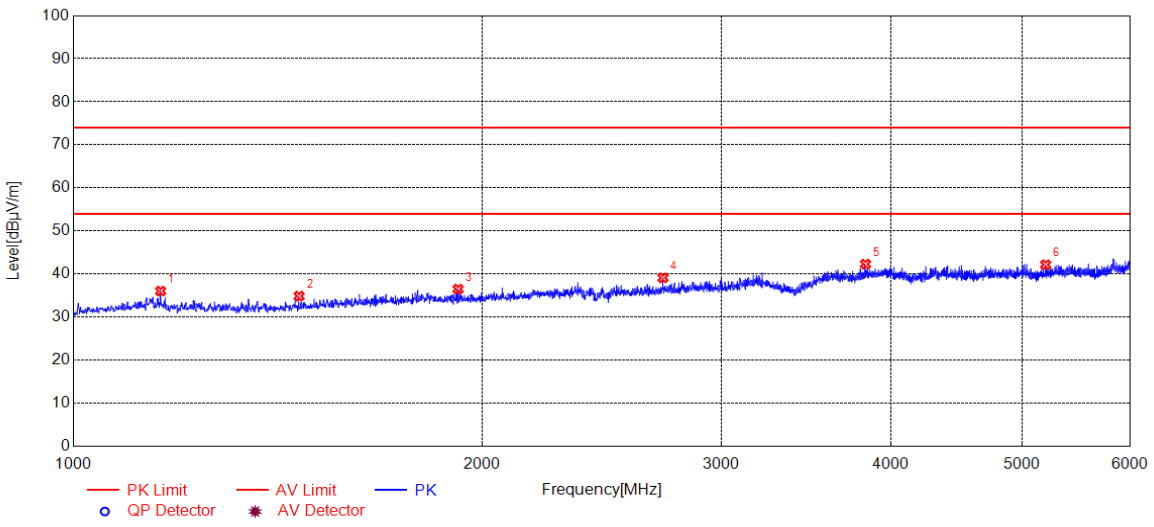
No.	Fre. MHz	Pk dBµV/m	QP dBµV/m	AV dBµV/m	Limit-PK dBµV/m	Limit-QP dBµV/m	Limit-AV dBµV/m	ANT	Verdict
1	1061.0122	32.80	N.A	N.A	74.00	N.A	54.00	H	PASS
2	1577.1154	35.51	N.A	N.A	74.00	N.A	54.00	H	PASS
3	2150.2300	36.50	N.A	N.A	74.00	N.A	54.00	H	PASS
4	3207.4415	39.19	N.A	N.A	74.00	N.A	54.00	H	PASS
5	4308.6617	40.94	N.A	N.A	74.00	N.A	54.00	H	PASS
6	5408.8818	41.58	N.A	N.A	74.00	N.A	54.00	H	PASS

Mode 4



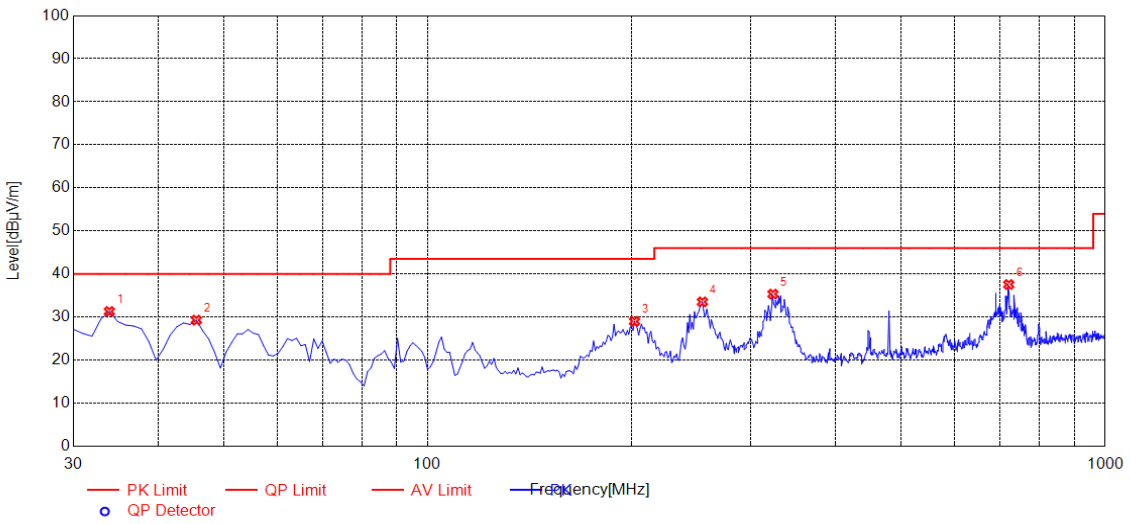
(Plot A: ANT-Vertical,30MHz - 1GHz)

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	35.8258	29.89	N.A	N.A	N.A	40.00	N.A	V	PASS
2	43.5936	28.39	N.A	N.A	N.A	40.00	N.A	V	PASS
3	54.2743	26.69	N.A	N.A	N.A	40.00	N.A	V	PASS
4	105.7357	24.92	N.A	N.A	N.A	43.50	N.A	V	PASS
5	203.8038	27.56	N.A	N.A	N.A	43.50	N.A	V	PASS
6	723.2733	36.51	N.A	N.A	N.A	46.00	N.A	V	PASS



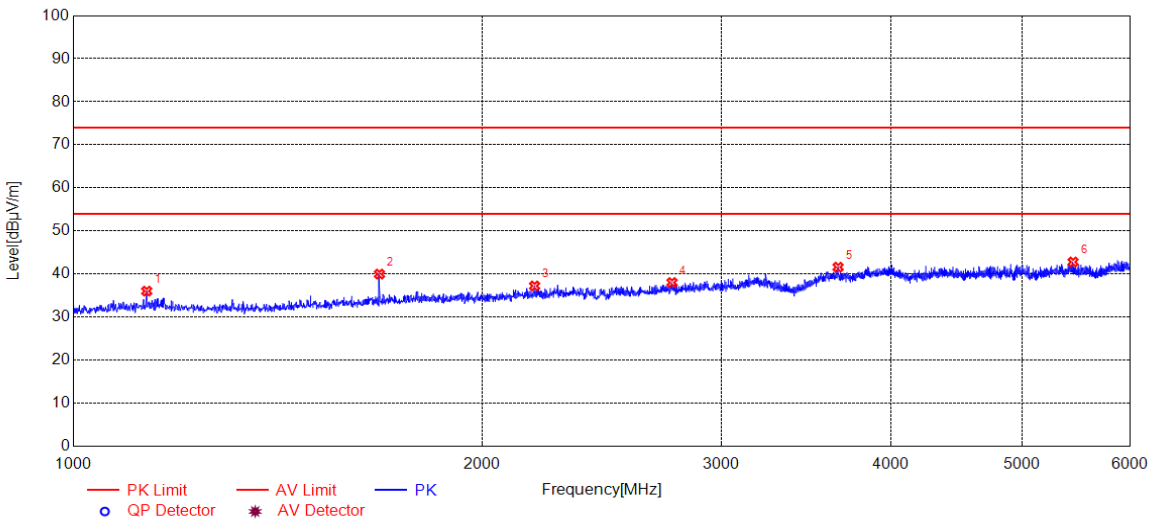
(Plot A: ANT-Vertical,1GHz - 6GHz)

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	1159.0318	36.05	N.A	N.A	74.00	N.A	54.00	V	PASS
2	1466.0932	34.88	N.A	N.A	74.00	N.A	54.00	V	PASS
3	1920.1840	36.51	N.A	N.A	74.00	N.A	54.00	V	PASS
4	2718.3437	39.12	N.A	N.A	74.00	N.A	54.00	V	PASS
5	3832.5665	42.31	N.A	N.A	74.00	N.A	54.00	V	PASS
6	5202.8406	42.17	N.A	N.A	74.00	N.A	54.00	V	PASS



(Plot B:ANT- Horizontal, 30MHz - 1GHz)

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	33.8839	31.32	N.A	N.A	N.A	40.00	N.A	H	PASS
2	45.5355	29.31	N.A	N.A	N.A	40.00	N.A	H	PASS
3	201.8619	29.01	N.A	N.A	N.A	43.50	N.A	H	PASS
4	254.2943	33.54	N.A	N.A	N.A	46.00	N.A	H	PASS
5	323.2332	35.35	N.A	N.A	N.A	46.00	N.A	H	PASS
6	720.3604	37.58	N.A	N.A	N.A	46.00	N.A	H	PASS



(Plot B:ANT- Horizontal, 1GHz - 6GHz)

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	1132.0264	36.04	N.A	N.A	74.00	N.A	54.00	H	PASS
2	1680.1360	39.99	N.A	N.A	74.00	N.A	54.00	H	PASS
3	2186.2372	37.24	N.A	N.A	74.00	N.A	54.00	H	PASS
4	2760.3521	38.04	N.A	N.A	74.00	N.A	54.00	H	PASS
5	3658.5317	41.60	N.A	N.A	74.00	N.A	54.00	H	PASS
6	5450.8902	42.81	N.A	N.A	74.00	N.A	54.00	H	PASS

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))	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. Morlab Laboratory
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. Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

3. Accreditation Certificate

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
JS32-RE	Version 2.0.2.0	Tonscend
TS+ -[JS32-CE]	Version2.5.0.0	Tonscend

5. Test Equipments Utilized

Description	Manufacturer	Model	Serial No.	Cal. Date	Due. Date
MXE EMI Receiver	Agilent	N9038A	MY54130016	2018.08.04	2019.08.03
Test Receiver	R&S	ESPI	101052	2018.08.04	2019.08.03
LISN	Schwarzbeck	NSLK 8127	812744	2018.05.08	2019.05.07
Pulse Limiter (20dB)	VTSD	9561D	9537	2018.05.08	2019.05.07
Test Antenna - Bi-Log	Schwarzbeck	VULB 9163	9163-519	2018.05.08	2019.05.07
Test Antenna - Horn	Schwarzbeck	BBHA 9120D	1774	2018.05.18	2019.05.17
Radiated Disturbance Preamplifier	rflight	S020180L3203	61171/61172	2018.07.12	2019.07.11
Radiated Disturbance Preamplifier	rflight	S10M100L3802	46732	2018.07.12	2019.07.11
Semi-Anechoic Chamber	CRT	9m*6m*6m	N/A	2017.01.12	2020.01.11
PC Adapter	LITE-ON POWER TECHNOLOGY(DONGGUAN) Co., LTD	A1374	C517271EA1000085	N/A	N/A
PC	Apple	A1370	C02FQ2PYDDQW	N/A	N/A

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