REPORT No.: SZ19070448E01

TEST REPORT

APPLICANT	:	Shenzhen Jaguar Wave Technology LTD
PRODUCT NAME	:	Wireless Gigabit Mobile Hotspot
MODEL NAME	:	JW-MRD-6001
BRAND NAME	:	JAGUAR WAVE/SUGAR lady
FCC ID	:	2ARPAJW-MRD-6001
STANDARD(S)	:	47 CFR Part 15 Subpart B
RECEIPT DATE	:	2019-08-02
TEST DATE	:	2019-08-09 to 2019-08-18
ISSUE DATE	:	2019-09-02

Edited by: Zhong Jinji(Rapporteur)

Approved by: Andy Yeh(Technical Director)

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DIRECTORY

Change History		
Version	**Date**	**Reason for change**
1.0	2019-09-02	First edition

1. Technical Information

Note: Provide by applicant

1.1. Applicant and Manufacturer Information

Applicant:	Shenzhen Jaguar Wave Technology LTD
Applicant Address:	Unit 1002/1003, Block 2A, Tongtai Times Center, No.6259 Baoan Road, Fuhai Street, Baoan District, Shenzhen City, P.R.China
Manufacturer:	Shenzhen Jaguar Wave Technology LTD
Manufacturer Address:	Unit 1002/1003, Block 2A, Tongtai Times Center, No.6259 Baoan Road, Fuhai Street, Baoan District, Shenzhen City, P.R.China

1.2. Equipment Under Test (EUT) Description

EUT Type:	Wireless Gigabit Mobile Hotspot
Serial No:	(N/A, marked #1 by test site)
Hardware Version:	P1
Software Version:	1.0.201810120116
Tx Frequency:	WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 40: 2300 MHz ~2400 MHz LTE Band 41: 2535 MHz ~ 2655 MHz 802.11b/g/n-20: 2412 MHz ~ 2462 MHz 802.11n-40: 2422 MHz ~ 2452 MHz 802.11a/ac/n: 5180 MHz ~ 5240 MHz; 5745 MHz ~ 5825 MHz
Rx Frequency:	WCDMA Band II: 1930 MHz ~ 1990 MHz WCDMA Band V: 869 MHz ~ 894 MHz LTE Band 5: 869 MHz ~ 894 MHz LTE Band 7: 2620 MHz ~ 2690 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 40: 2300 MHz ~2400 MHz LTE Band 41: 2535 MHz ~ 2655 MHz 802.11b/g/n-20: 2412 MHz ~ 2462 MHz 802.11n-40: 2422 MHz ~ 2452 MHz 802.11a/ac/n: 5180 MHz ~ 5240 MHz; 5745 MHz ~ 5825 MHz
Antenna Type:	3G/4G: PIFA Antenna

	2.4G WIFI : PIFA Antenna 5G WIFI : PIFA Antenna	
Type of Modulation:	WCDMA: QPSK(Uplink) LTE: QPSK, 16QAM, 64QAM 802.11b: DSSS (DBPSK / DQPSK / CCK) 802.11g/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11a/ac/n: OFDM (BPSK / QPSK / 16QAM / 64QAM)	
Ancillary Equipment:	**AC Adapter**	
	Brand Name:	N/A
	Model No.:	TN-090200U1
	Serial No.:	(N/A, marked #1 by test site)
	Rated Input:	100-240V ～ 50/60Hz 0.5A
	Rated Output:	5.0V⎓3.0A or 9.0V⎓2.0A or 12.0V⎓1.5A
	Battery	
	Brand Name:	N/A
	Model No.:	JW-MRD-6001
	Serial No.:	(N/A, marked #1 by test site)
	Capacity:	4000mAh
	Rated Voltage:	3.85V
	Charge Limit:	4.4V

Note:

1. The Wireless Gigabit Mobile Hotspot supports WCDMA Band II, Band V, LTE Band5/7/38/40/41, WIFI.
2. 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	Method determination Remark
1	15.107	Conducted Emission	2019.08.18	Lin Jiayong	PASS	No deviation
2	15.109	Radiated Emission	2019.08.09	Peng Xuewei	PASS	No deviation

NOTE 1: The tests were performed according to the method of measurements prescribed in ANSI C63.4-2014.

NOTE 2:additions to, deviation, or exclusions from the method shell be judged in the"method determination" column of add, deviate or exclude from the specific method shell be explained in the "Remark" of the above table.

2.2. EUT Setup and Operating Conditions

Test Item	
Radiated Emission	
Mode 1 :	EUT + LAN + USB Cable + PHONE(charge the phone) + WIFI Idle + WCDMA idle + LTE idle
Mode 2 :	**EUT + LAN + Adapter(Charging Mode)**
Mode 3	EUT + LAN + USB Cable + PC (Data Transfer Mode)
Conducted Emission	
Mode 1 :	EUT + LAN + USB Cable + PHONE(charge the phone) + WIFI Idle + WCDMA idle + LTE idle
Mode 2 :	EUT + LAN + Adapter(Charging Mode)
Mode 3	**EUT + LAN + USB Cable + PC (Data Transfer Mode)**
Remark: The above test modes in boldface (Mode2) were the worst cases of radiated emission tests; The above test modes in boldface (Mode3) were the worst cases of conducted emission tests; only the test data of these modes was 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:

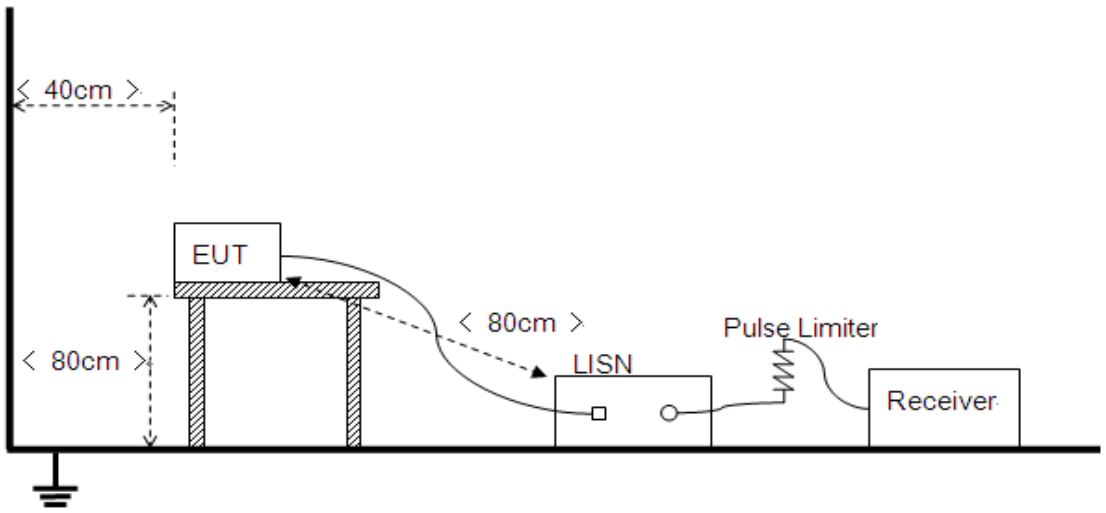
a) The limit subjects to the Class B digital device.

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.



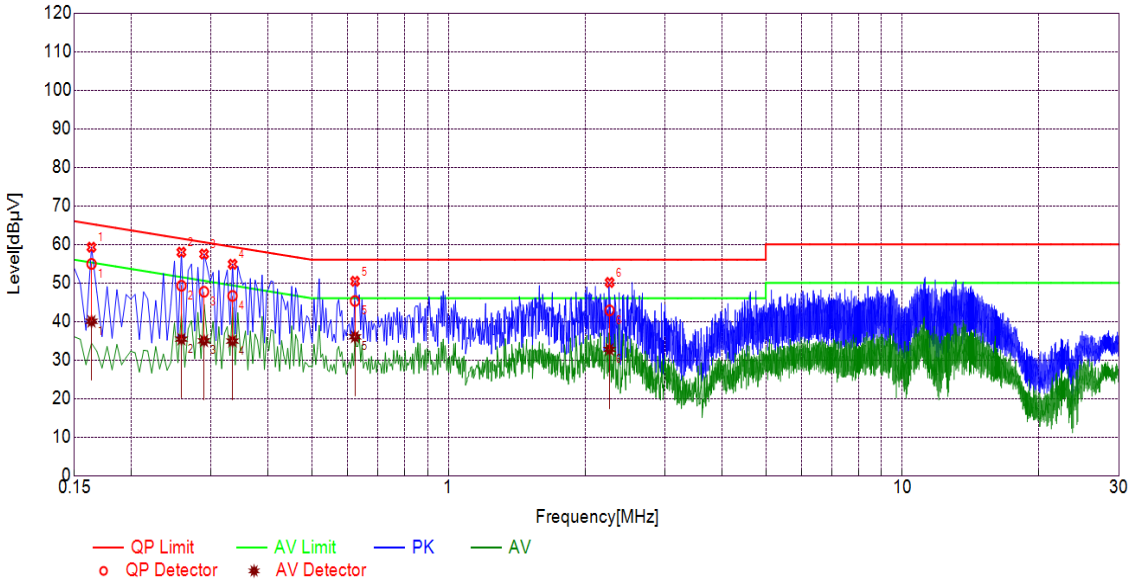
The EUT is placed on a 0.8m high insulating table, which stands on the grounded conducting floor, and keeps 0.4m away from the grounded conducting wall. The EUT is connected to the power mains through a LISN which provides 50Ω/50μH of coupling impedance for the measuring instrument. A Pulse Limiter is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

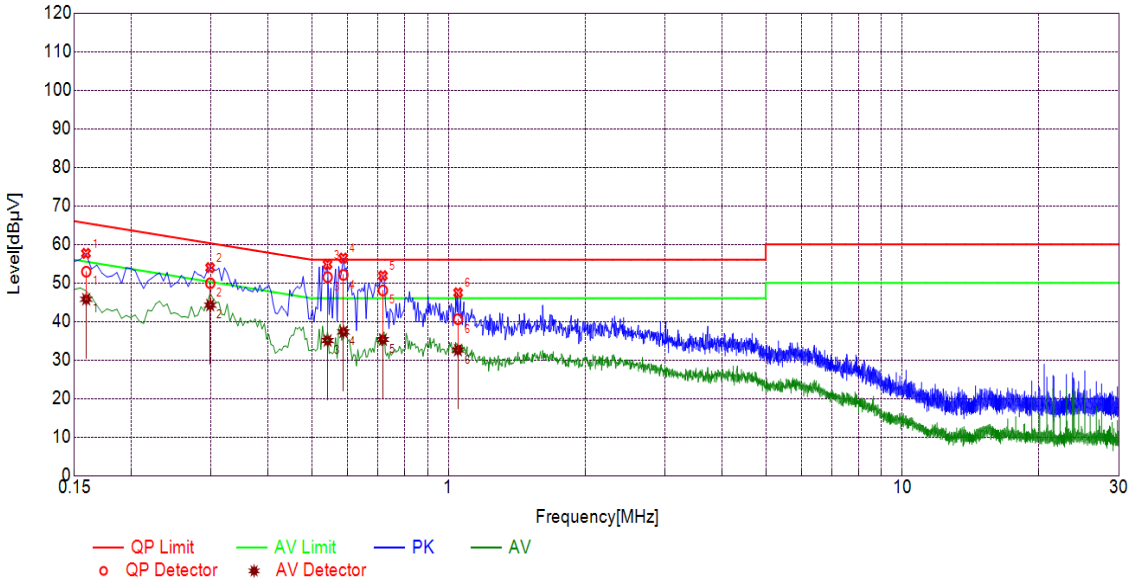
The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines 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:



(Plot A:L Phase)

NO.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1635	54.93	40.03	65.28	55.28	Line	PASS
2	0.2580	49.26	35.41	61.49	51.49		PASS
3	0.2893	47.71	34.97	60.54	50.54		PASS
4	0.3343	46.62	34.92	59.34	49.34		PASS
5	0.6222	45.31	36.02	56.00	46.00		PASS
6	2.2643	42.87	32.75	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	0.1592	52.92	45.76	65.51	55.51	Neutral	PASS
2	0.2986	49.92	44.22	60.28	50.28		PASS
3	0.5416	51.49	35.06	56.00	46.00		PASS
4	0.5868	52.08	37.30	56.00	46.00		PASS
5	0.7170	48.05	35.32	56.00	46.00		PASS
6	1.0492	40.57	32.58	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).

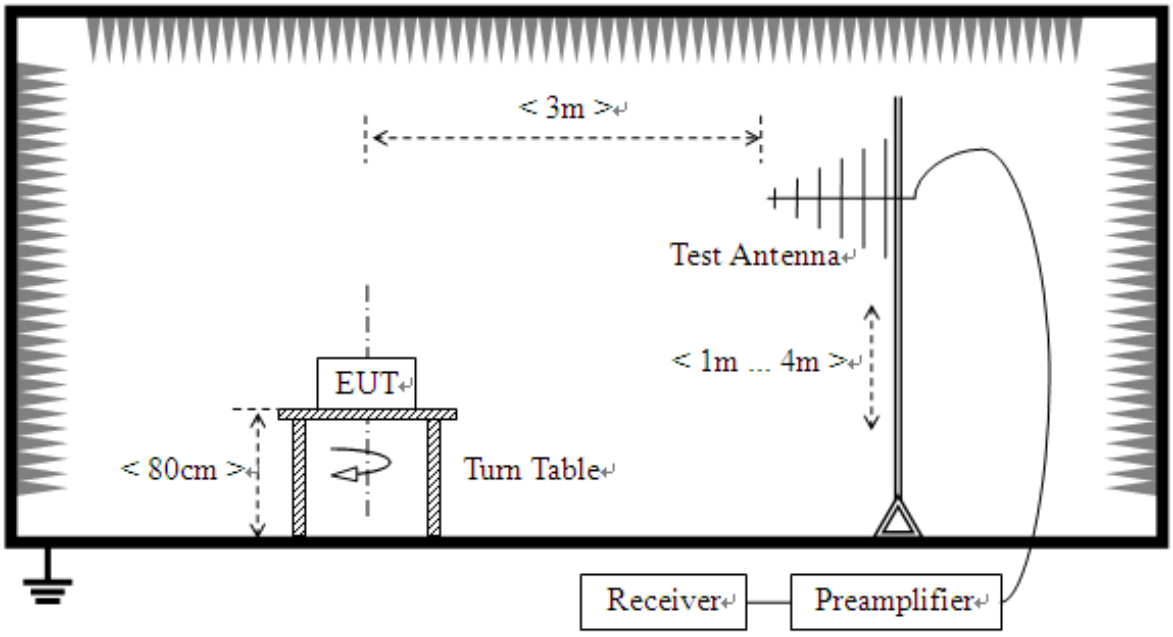
3.2.2. Frequency range of measurement

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

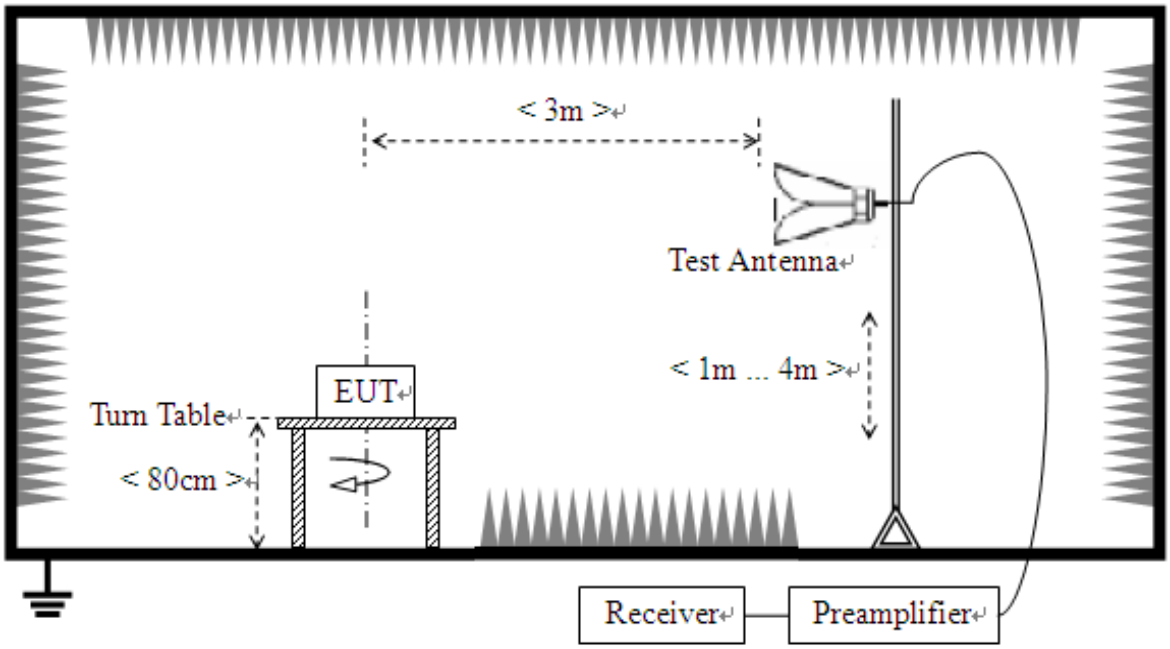
Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30.
1.705–108	1000.
108–500	2000.
500–1000	5000.
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower.

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:

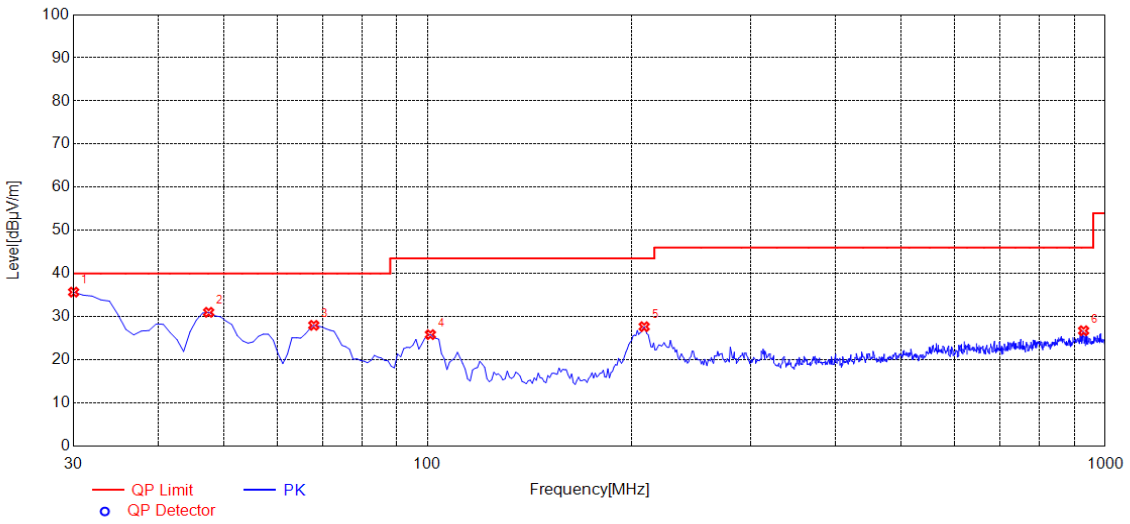
In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength. The emission levels at both horizontal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

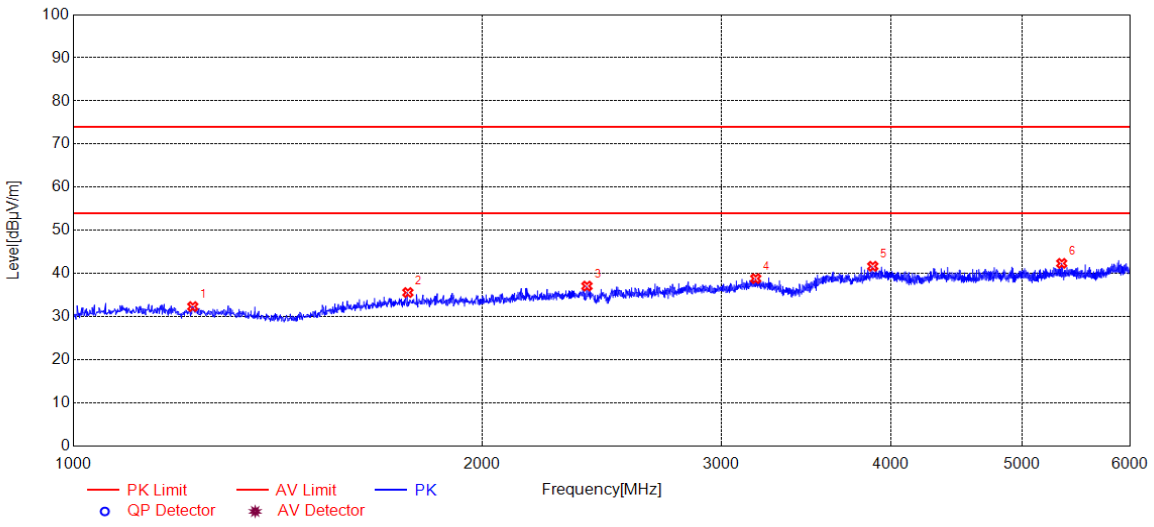
The amplitude of emissions which (6GHz-30GHz) are attenuated more than 20 dB below the permissible value need not be reported.

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.



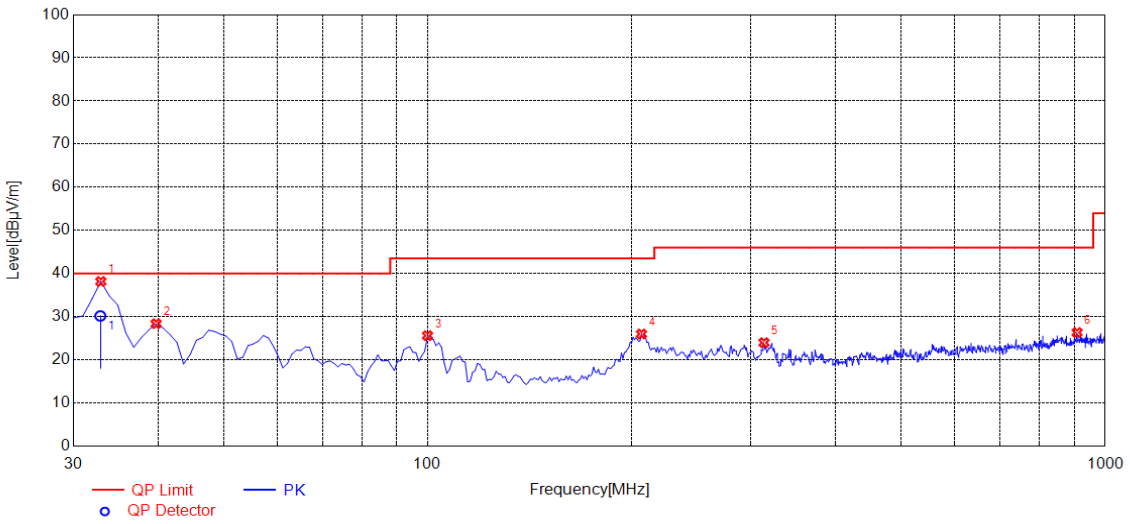
(Plot A: ANT-Vertical,30MHz - 1GHz)

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	30.0000	35.70	N.A	N.A	N.A	40.00	N.A	V	PASS
2	47.4775	31.02	N.A	N.A	N.A	40.00	N.A	V	PASS
3	67.8679	28.00	N.A	N.A	N.A	40.00	N.A	V	PASS
4	100.8809	25.85	N.A	N.A	N.A	43.50	N.A	V	PASS
5	208.6587	27.69	N.A	N.A	N.A	43.50	N.A	V	PASS
6	929.1191	26.75	N.A	N.A	N.A	46.00	N.A	V	PASS



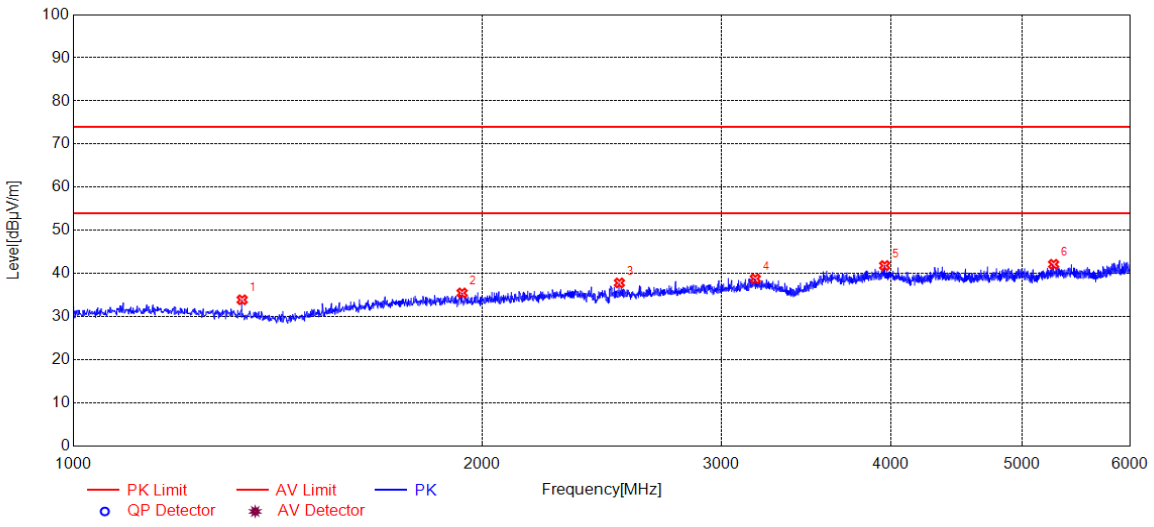
(Plot B: ANT-Vertical,1GHz - 6GHz)

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	1224.0448	32.35	N.A	N.A	74.00	N.A	54.00	V	PASS
2	1763.1526	35.60	N.A	N.A	74.00	N.A	54.00	V	PASS
3	2389.2779	37.10	N.A	N.A	74.00	N.A	54.00	V	PASS
4	3181.4363	38.83	N.A	N.A	74.00	N.A	54.00	V	PASS
5	3880.5761	41.69	N.A	N.A	74.00	N.A	54.00	V	PASS
6	5346.8694	42.36	N.A	N.A	74.00	N.A	54.00	V	PASS



(Plot C: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	32.8495	38.17	30.18	N.A	N.A	40.00	N.A	H	PASS
2	39.7097	28.38	N.A	N.A	N.A	40.00	N.A	H	PASS
3	99.9099	25.61	N.A	N.A	N.A	43.50	N.A	H	PASS
4	206.7167	25.99	N.A	N.A	N.A	43.50	N.A	H	PASS
5	313.5235	23.99	N.A	N.A	N.A	46.00	N.A	H	PASS
6	908.7287	26.33	N.A	N.A	N.A	46.00	N.A	H	PASS



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

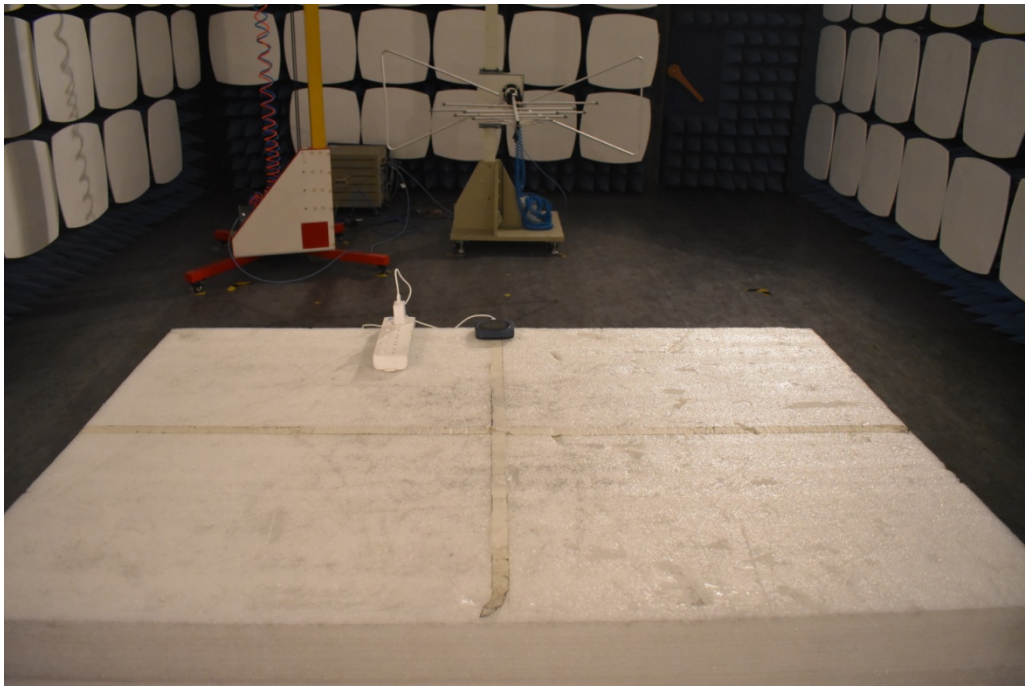
No.	Fre. MHz	Pk dBµV/m	QP dBµV/m	AV dBµV/m	Limit-PK dBµV/m	Limit-QP dBµV/m	Limit-AV dBµV/m	ANT	Verdict
1	1331.0662	33.92	N.A	N.A	74.00	N.A	54.00	H	PASS
2	1933.1866	35.50	N.A	N.A	74.00	N.A	54.00	H	PASS
3	2524.3049	37.83	N.A	N.A	74.00	N.A	54.00	H	PASS
4	3179.4359	38.79	N.A	N.A	74.00	N.A	54.00	H	PASS
5	3959.5919	41.85	N.A	N.A	74.00	N.A	54.00	H	PASS
6	5273.8548	42.15	N.A	N.A	74.00	N.A	54.00	H	PASS

Annex A Photographs of Test Setup

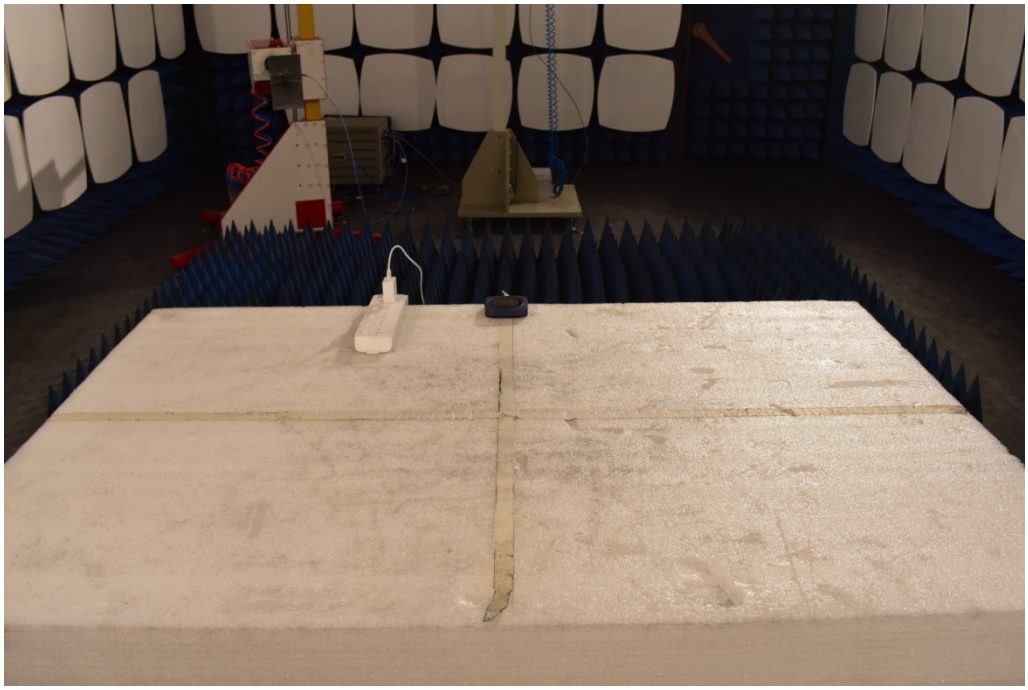
1. Mains Terminal Disturbance Voltage Measurement

2. Conducted emission main's port side view

3. Radiated Field Strength Measurement(30MHz-1GHz)



4. Radiated Field Strength Measurement(above 1GHz)



Annex B 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 C 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	2019.08.04	2020.08.03
Test Receiver	R&S	ESPI	101052	2019.08.04	2020.08.03
LISN	Schwarzbeck	NSLK 8127	812744	2019.05.08	2020.05.07
Pulse Limiter (20dB)	VTSD	9561D	9537	2019.05.08	2020.05.07
Test Antenna - Bi-Log	Schwarzbeck	VULB 9163	9163-519	2019.05.08	2020.05.07
Test Antenna - Horn	Schwarzbeck	BBHA 9120D	1774	2019.05.08	2020.05.07
Radiated Disturbance Preamplifier	rflight	S020180L3203	61171/61172	2019.07.12	2020.07.11
Radiated Disturbance Preamplifier	rflight	S10M100L3802	46732	2019.07.12	2020.07.11
Semi-Anechoic Chamber	CRT	9m*6m*6m	N/A	2017.01.12	2020.01.11

END OF REPORT