REPORT No. : SZ17070188E02

FCC TEST REPORT

APPLICANT	:	Shenzhen Renqing Excellent Investment Co.,Ltd
PRODUCT NAME	:	Bluetooth Speaker
MODEL NAME	:	RAU0585,RAU0586,RAU0587,RAU0588,RAU0589, RAU0590
TRADE NAME	:	N/A
BRAND NAME	:	ROCK, rock space, ROCK Lava
FCC ID	:	2ALT3-RQZY2201
STANDARD(S)	:	47 CFR Part 15 Subpart B
TEST DATE	:	2017-07-30 to 2017-08-11
ISSUE DATE	:	2017-08-14

SHENZHEN MORLAB COMMUNICATIONS TECHNOLOGY Co., Ltd.

MORLAB GROUP
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DIRECTORY

Change History		
Issue	Date	Reason for change
1.0	2017-08-14	First edition

Test Report Declaration

Applicant	Shenzhen Renqing Excellent Investment Co.,Ltd
Applicant Address	3/F,Block A7 Nanshan iPark,NO.1001 Xueyuan Road, Nanshan District,Shenzhen
Manufacturer	Shenzhen Dehuida Intelligent Technology Co.,Ltd.
Manufacturer Address	Building D/E,No.237 Xikeng Road,Fucheng Street,Longhua New District,Shenzhen City,Guangdong Province,P.R.China
Product Name	Bluetooth Speaker
Model Name	RAU0585,RAU0586,RAU0587,RAU0588,RAU0589,RAU0590
Brand Name	ROCK, rock space, ROCK Lava
HW Version	1.0
SW Version	1.0
Test Standards	47 CFR Part 15 Subpart B
Test Result	PASS

Tested by : Wu Zhongwen

Wu Zhongwen (Test Engineer)

Approved by : Andy Yeh

Andy Yeh (Technology Director)

1. Technical Information

Note： Provided by applicant

1.1. Applicant Information

Company： Shenzhen Renqing Excellent Investment Co.,Ltd

Address： 3/F,Block A7 Nanshan iPark,NO.1001 Xueyuan Road, Nanshan District, Shenzhen

1.2. Equipment under Test (EUT) Description

EUT Type:	Bluetooth Speaker
Serial No:	(N/A, marked #1 by test site)
Hardware Version:	1.0
Software Version:	1.0

Power supply :	**Battery**	
	Brand Name:	N/A
	Model No.:	GSP103450
	Serial No.:	(N/A, marked #1 by test site)
	Capacity:	1800mAh
	Rated Voltage:	3.7V
	Charge Limit:	4.2V±0.01V

NOTE:

1. The application for Bluetooth Speaker RAU0585, RAU0586, RAU0587, RAU0588, RAU0589, RAU0590.

   According to the certificate holder Shenzhen Renqing Excellent Investment Co,ltd, the models RAU0585,RAU0586,RAU0587,RAU0588,AU0589,AU0590 are accordant in both hardware platform and software.

   Followings are the highlighted items which are same between these six products

   a. The number of PCB used in the product.

   b. All PCB layout.

c. Bluetooth module.

d. Power supply mode

e. Operating voltage

The detail difference between these six products, application is as below:

f. The appearances are different.

2. The EUT is a Bluetooth Speaker which supports ISM 2.4GHz Bluetooth band.
3. The EUT is equipped with a Micro USB port which can be connected to ancillary equipments.
4. 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	Result
1	15.107	Conducted Emission	2017.08.06	PASS
2	15.109	Radiated Emission	2017.08.07	PASS

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

3. Test Conditions Setting

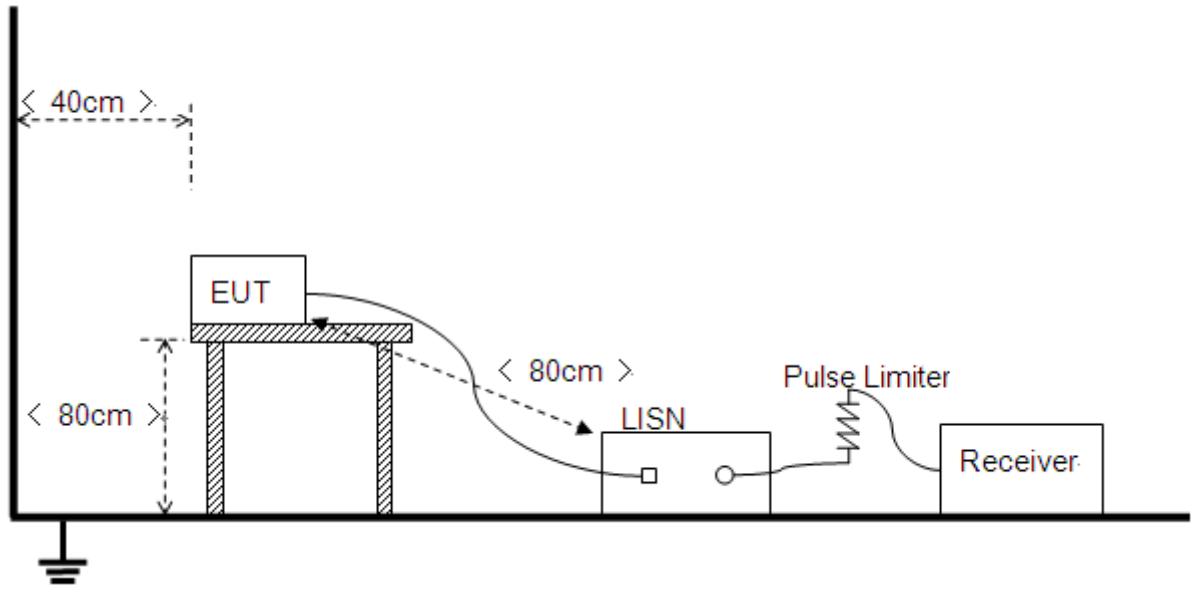
3.1. Test Mode

1	**The first test mode**
	The EUT configuration of the emission tests is EUT + Battery + PC. During the measurement, the EUT was connected to a PC via the Micro-B USB port for software upgrades.
2	**The second test mode**
	The EUT configuration of the emission tests is EUT + Battery + Adapter. During the measurement, the EUT was connected to the Adapter via the Micro-B USB port and charged by the Adapter, meanwhile, the EUT was working normally as an intentional device.
3	**The third test mode**
	The EUT configuration of the emission tests is EUT + Battery + Adapter + Mobile Phone. During the measurement, the EUT was connected to the Adapter via the Micro-B USB port and Mobile Phone via the AUX in port, meanwhile, the EUT was working normally as an intentional device.
NOTE: All test modes are performed in the test, only the worst case (the third) is recorded in this report.	

3.2. Test Setup and Equipments List

3.2.1. Conducted Emission

A. Test Setup:



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 inma intained with respect to the impedance characteristics as prescribed in ANSI C63.4-2014 at Clause 4.3.

B. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Due. Date
Receiver	Narda	PMM 9010	595WX11007	2017.05.17	2018.05.16
LISN	Schwarzbeck	NSLK 8127	812744	2017.05.17	2018.05.16
Pulse Limiter (20dB)	VTSD	9561D	9537	2017.05.17	2018.05.16
Adapter	ZTE	STC-A515A	N/A	N/A	N/A

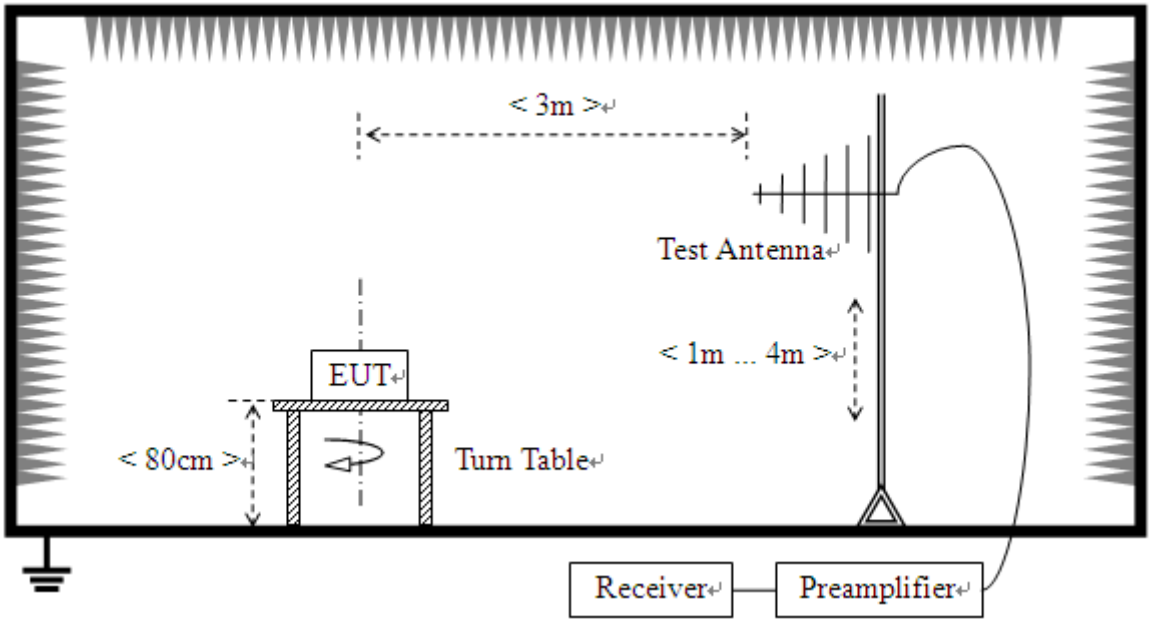
C. Test Software Utilized

Model	Version Number	Producer
TS+ -[JS32-CE]	Version2.5.0.0	Tonscend

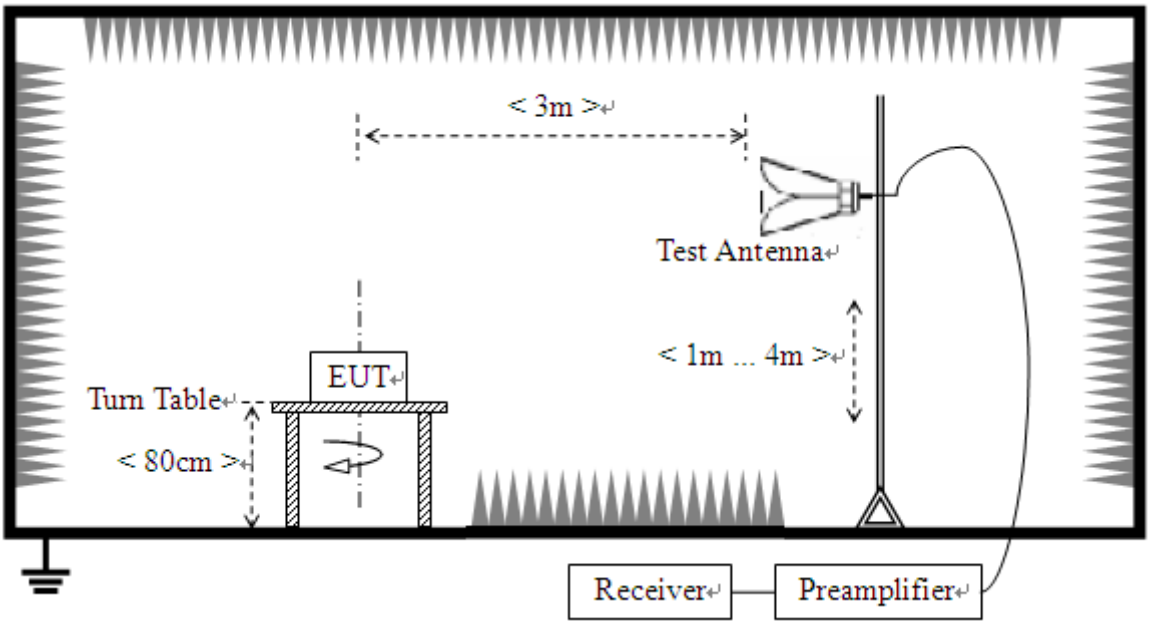
3.2.2. Radiated Emission

A. 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 theTest 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 TestAntenna (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.

B. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Due. Date
MXE EMI Receiver	Agilent	N9038A	MY54130016	2017.05.17	2018.05.16
Semi-Anechoic Chamber	Changning	9m*6m*6m	N/A	2017.01.11	2018.01.10
Test Antenna - Bi-Log	Schwarzbeck	VULB 9163	9163-274	2016.12.09	2017.12.08
Test Antenna - Horn	Schwarzbeck	BBHA9120C	9120C-384	2017.05.17	2018.05.16
Adapter	ZTE	STC-A515A	N/A	N/A	N/A

C. Test Software Utilized

Model	Version Number	Producer
MORLAB EMCR V1.2	Version 1.0	MORLAB

4. 47 CFR Part 15B Requirements

4.1. Conducted Emission

4.1.1. Requirement

According to FCC section 15.107, the radio frequency voltage that is conducted back onto the ACpower line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in thefollowing 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.

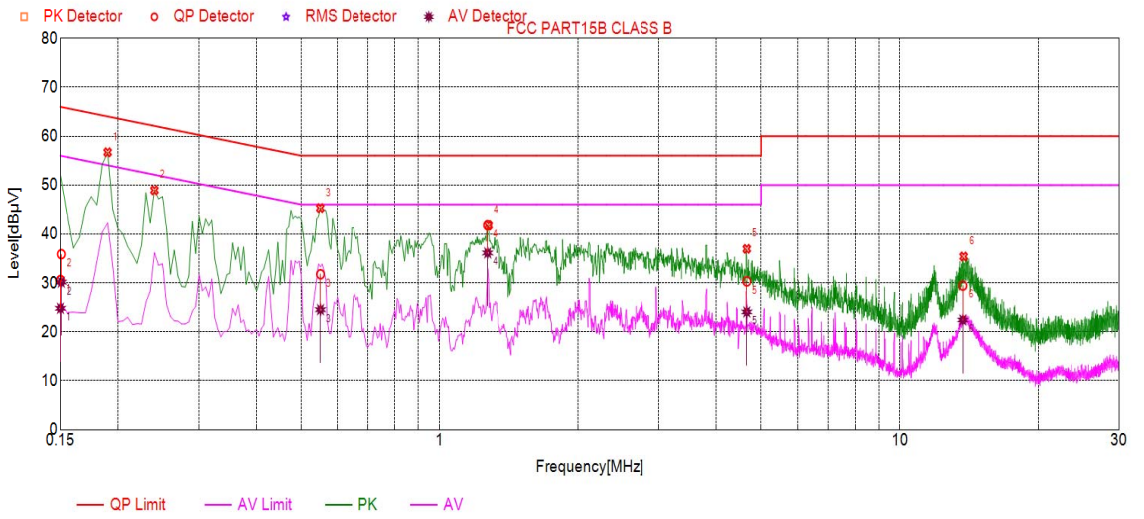
4.1.2. Test Description

See section 3.2.1 of this report.

4.1.3. Test Result

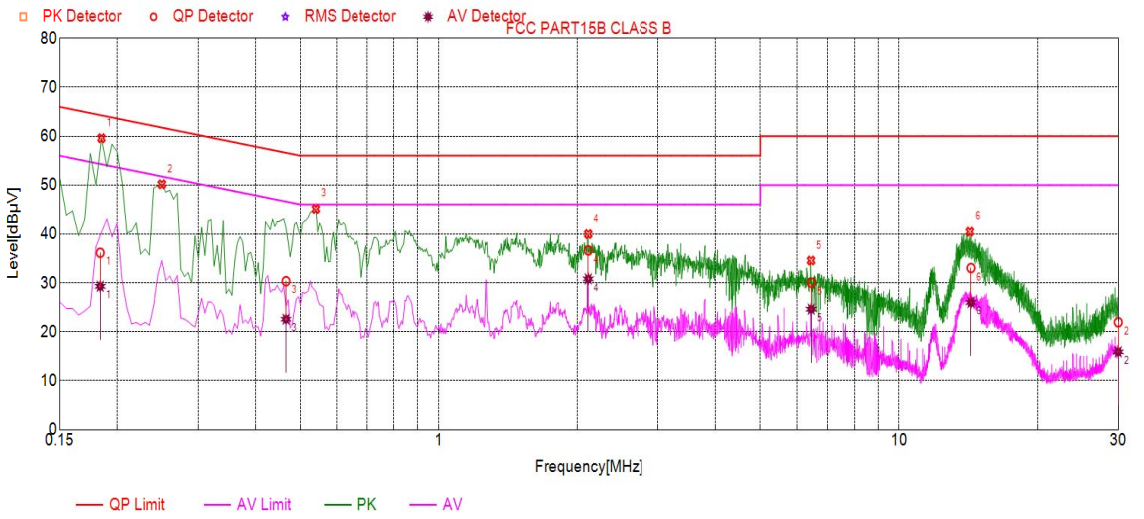
The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors.Tests for both L phase and N phase lines 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	0.15	30.60	24.80	66.00	56.00	Line	PASS
2	0.1506	35.89	30.15	65.97	55.97		PASS
3	0.5504	31.78	24.53	56.00	46.00		PASS
4	1.2692	41.82	36.15	56.00	46.00		PASS
5	4.655	30.31	24.07	56.00	46.00		PASS
6	13.7562	29.45	22.43	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	0.1838	36.17	29.30	64.31	54.31	Neutral	PASS
2	29.9946	21.96	15.90	60.00	50.00		PASS
3	0.4652	30.35	22.57	56.60	46.60		PASS
4	2.1098	36.66	30.82	56.00	46.00		PASS
5	6.4496	30.07	24.62	60.00	50.00		PASS
6	14.3746	33.05	25.99	60.00	50.00		PASS

Result: Pass

4.2. Radiated Emission

4.2.1. Requirement

According to FCC section 15.109 (a), the field strength of radiated emissions from unintentionalradiators 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 FCCsection 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).

4.2.2. Test Description

See section 3.2.2 of this report.

4.2.3. 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.

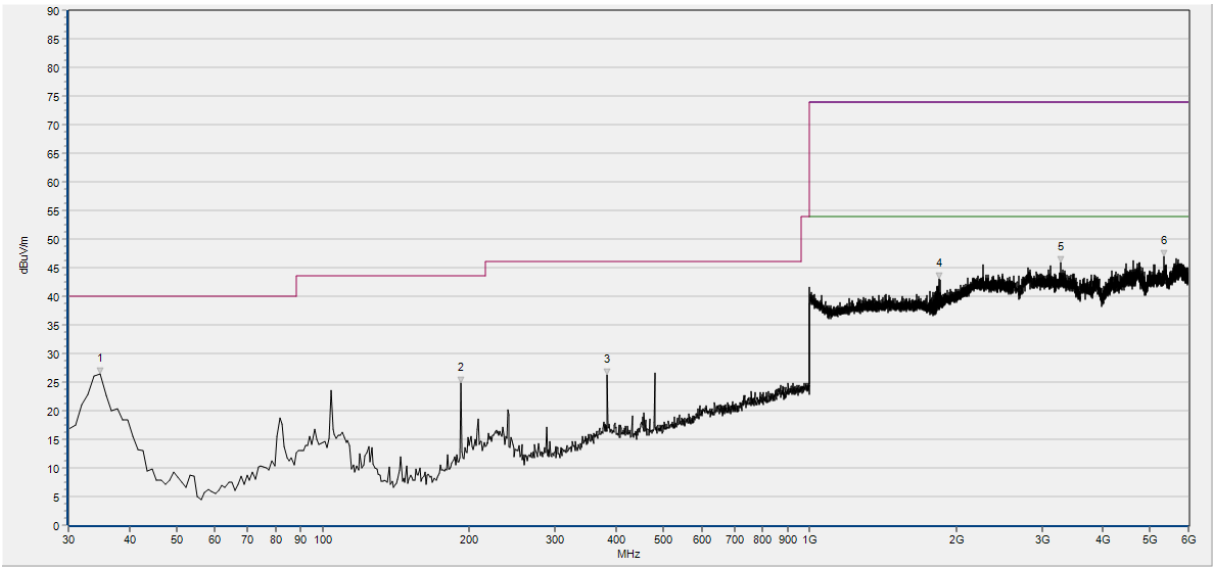
4.2.4. Test Result

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

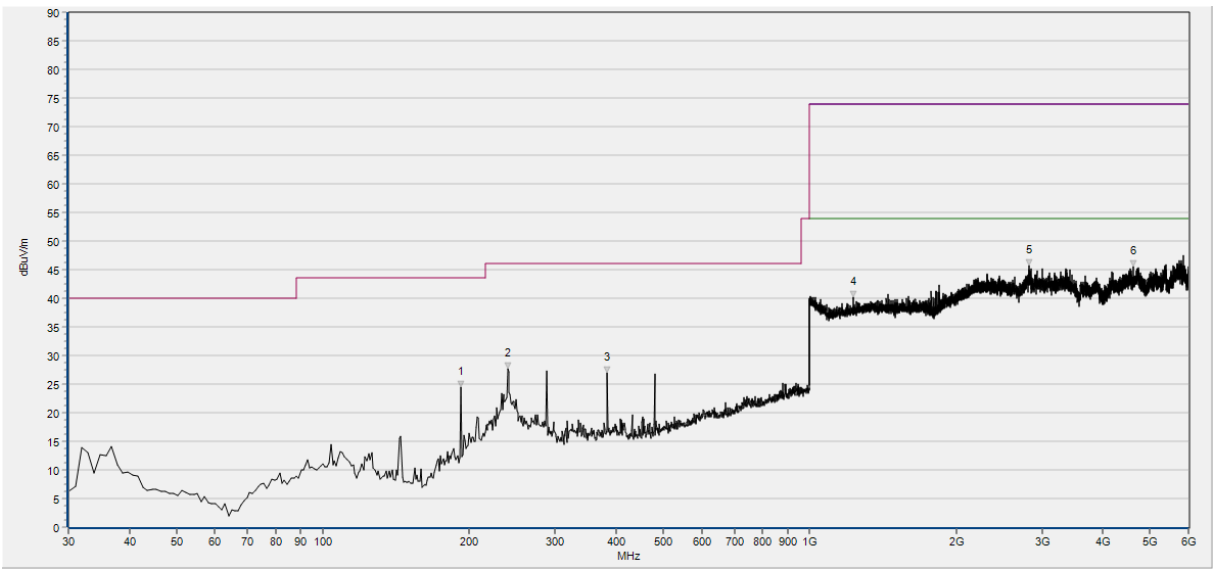
Note: All radiated emission tests were performed in X, Y, Z axis direction, and only the worst axis test condition was recorded in this test report.

A. Test Plots and Suspicious Points:



(Plot A: 30MHz – 6GHz, Test Antenna Vertical)

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	34.850	N.A.	26.46	N.A.	N.A.	40.00	N.A.	V	PASS
2	191.990	N.A.	24.76	N.A.	N.A.	43.50	N.A.	V	PASS
3	384.050	N.A.	26.25	N.A.	N.A.	46.00	N.A.	V	PASS
4	1840.533	43.10	N.A.	35.85	74.00	N.A.	54.00	V	PASS
5	3277.120	45.87	N.A.	37.02	74.00	N.A.	54.00	V	PASS
6	5345.600	46.90	N.A.	39.37	74.00	N.A.	54.00	V	PASS



(Plot B: 30MHz – 6GHz, Test Antenna Horizontal)

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	191.990	N.A.	24.40	N.A.	N.A.	43.50	N.A.	H	PASS
2	239.520	N.A.	27.61	N.A.	N.A.	46.00	N.A.	H	PASS
3	384.050	N.A.	26.94	N.A.	N.A.	46.00	N.A.	H	PASS
4	1230.933	40.14	N.A.	33.25	74.00	N.A.	54.00	H	PASS
5	2826.560	45.66	N.A.	38.64	74.00	N.A.	54.00	H	PASS
6	4612.160	45.59	N.A.	39.02	74.00	N.A.	54.00	H	PASS

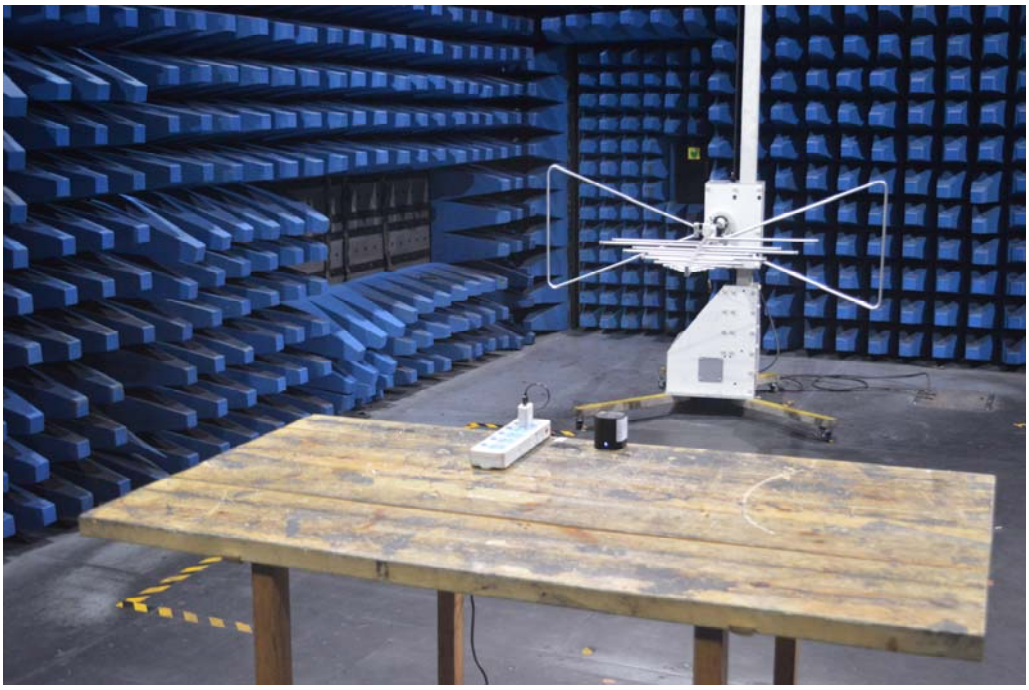
Result: Pass

Annex A Test Setup Photos

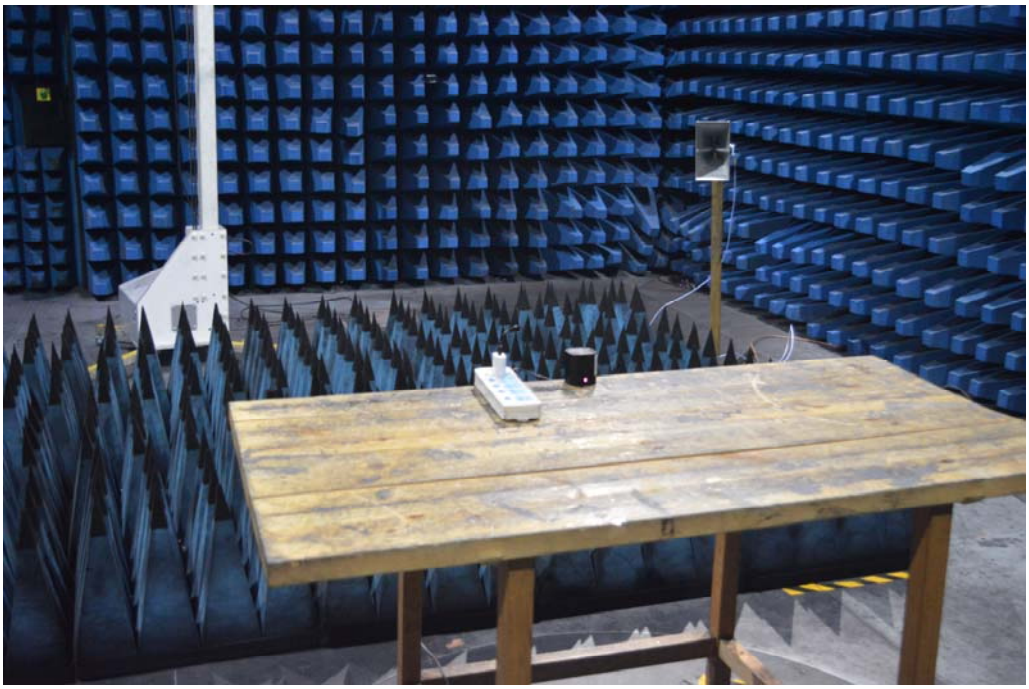
1. Conducted emission main's port front view

2. Conducted emission main's port side view

3. Radiated emission (30MHz-1GHz)



4. Radiated emission (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:	±1.8dB
Uncertainty of Radiated Emission:	±3.1dB

Annex C Testing Laboratory Information

1. Identification of the Responsible Testing Laboratory

Company Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Department:	Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
Responsible Test Lab Manager:	Mr. Su Feng
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.

(Shenzhen Morlab Communications Technology Co., Ltd.)

4. Test Environment Conditions

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

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

***** END OF REPORT *****