REPORT No.: SZ18080124W04

TEST REPORT

APPLICANT	:	Social Bicycles LLC
PRODUCT NAME	:	Clarion Module
MODEL NAME	:	Clarion Module R6
BRAND NAME	:	JUMP Bikes
FCC ID	:	2ADEK1808R6
STANDARD(S)	:	47 CFR Part 15 Subpart C
TEST DATE	:	2018-10-27 to 2018-10-28
ISSUE DATE	:	2018-10-29

Tested by: Peng Xuewei

Peng Xuewei (Test Engineer)

Approved by:

Peng Huarui (Supervisor)

MORLAB

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DIRECTORY

Change History		
Issue	**Date**	**Reason for change**
1.0	2018-10-29	First edition

1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Social Bicycles LLC
Applicant Address:	55 Prospect ST. Suite 410 Brooklyn, New York 11201, United States
Manufacturer:	E-BUSINESS INTERNATIONAL TECHNOLOGY(SHENZHEN) CO.LTD
Manufacturer Address:	Floor 2, Tower A, New Energy Building, Nanhai Road, Nanshan, Shenzhen,China

1.2. Equipment Under Test (EUT) Description

Product Name:	Clarion Module
Serial No:	(N/A, marked #1 by test site)
Hardware Version:	R6
Software Version:	1.0.3_rc1
Frequency Range:	13.553MHz-13.567MHz
Operating Frequency:	13.56MHz
Modulation Type:	ASK
Antenna Type:	PCB Antenna

Note 1: The EUT supports NFC function.

Note 2: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

1.3. Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart C for the EUT FCC ID Certification:

No	Identity	Document Title
1	47 CFR Part 15 (10-1-15 Edition)	Radio Frequency Devices

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

No.	Section	Description	Test Engineer	Test Date	Result
1	15.203	Antenna Requirement	N/A	N/A	PASS
2	15.207	Conducted Emission	N/A	N/A	N/A_{Note1}
3	15.209 15.225(a)(b)(c)(d)	Radiated Emission	Peng Xuewei	Oct 27, 2018	PASS
4	15.225(e)	Frequency Tolerance	Peng Xuewei	Oct 28, 2018	PASS
5	15.215(c)	20dB Bandwidth	Peng Xuewei	Oct 27, 2018	PASS
Note 1: Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. **Note 2:** The tests were performed according to the method of measurements prescribed in ANSI C63.10-2013. The EUT has been tested under continuous operating condition					

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1.4. Environmental 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

2. 47 CFR Part 15C Requirements

2.1. Antenna requirement

2.1.1. Applicable Standard

According to FCC 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

2.1.2. Result:

The EUT has a permanently and irreplaceable attached antenna. Please refer to the EUT internal photos.

Result: Compliant

2.2. Conducted Emission

2.2.1. Test Requirement

According to FCC section 15.207, 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).

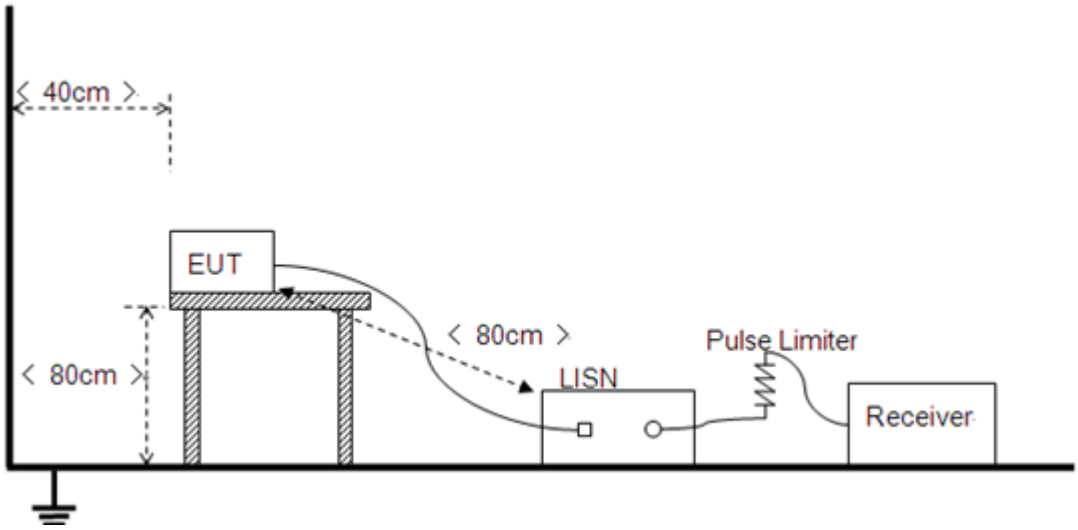
Frequency range (MHz)	Conducted Limit (dBμV)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

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.

2.2.2. 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.

2.2.3. Test Result

This test case does not apply this kind of EUT.

2.3. Radiated Emission

2.3.1. Test Requirement

Radiated Emission <30MHz (9 kHz-30MHz, E-field)

According to FCC section 15.225, for <30MHz, Radiated emissions were measured according to ANSIC63.4. The EUT was set to transmit at the highest output power. The EUT was set 30 meter away from the measuring antenna. The loop antenna was positioned 1 meter above the ground from the center of the loop. The measuring bandwidth was set to 10KHz. (Note: During testing the receive antenna was rotated about its axis to maximize the emission from the EUT)

There was no detected Restricted bands and Radiated Spurious emission below 30MHz. The 30m limit was converted to 3m Limit using square factor(x) as it was found by measurements as follows;

3 m Limit(dBuV/m) = 20log(X)+40log(30/3)= 20log(15848)+40log(30/3) = 124dBuV

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 range (MHz)	Field Strength@30m		Field Strength@3m
	μV/m	dBμV/m	dBμV/m
Below 13.110	30	29.5	69.5
13.110 ~ 13.410	106	40.5	80.5
13.410 ~ 13.553	334	50.5	90.5
13.553 ~13.567	15.848	84	124
13.567 ~ 13.710	334	50.5	90.5
13.710 ~14.010	106	40.5	80.5
Above 14.010	30	29.5	69.5

NOTE: a) Field Strength (dBμV/m) = 20*log[Field Strength (μV/m)].

b) In the emission tables above, the tighter limit applies at the band edges.

Radiated Emission >30MHz (30MHz-1GHz, E-field)

According to FCC section 15.205, the field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the following values:

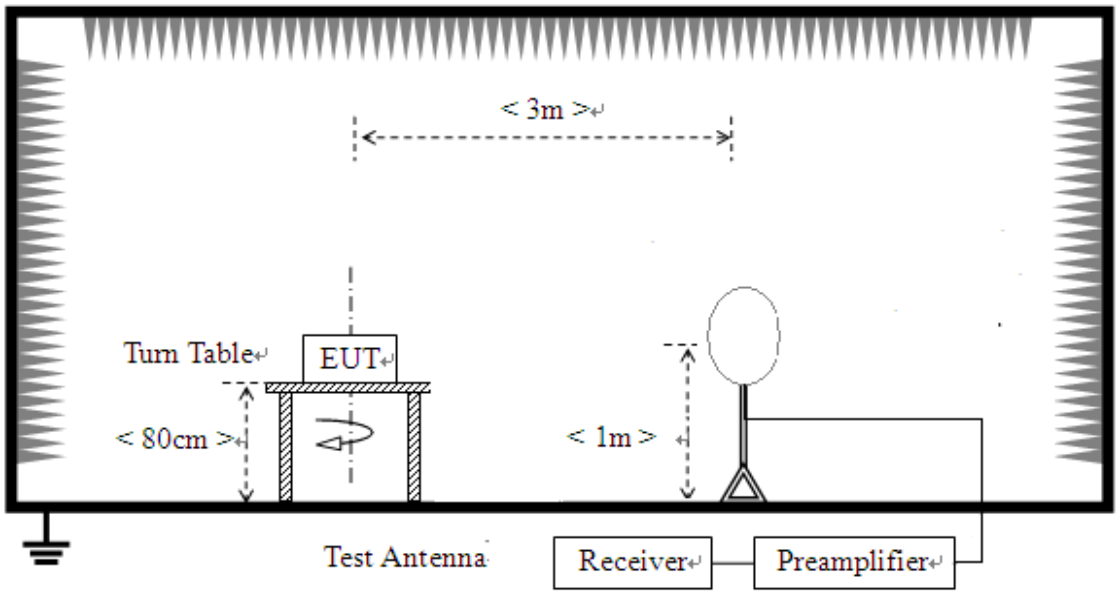
Frequency range (MHz)	Field Strength	
	μV/m	dBμV/m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

NOTE: a) Field Strength (dBμV/m) = 20*log[Field Strength (μV/m)].

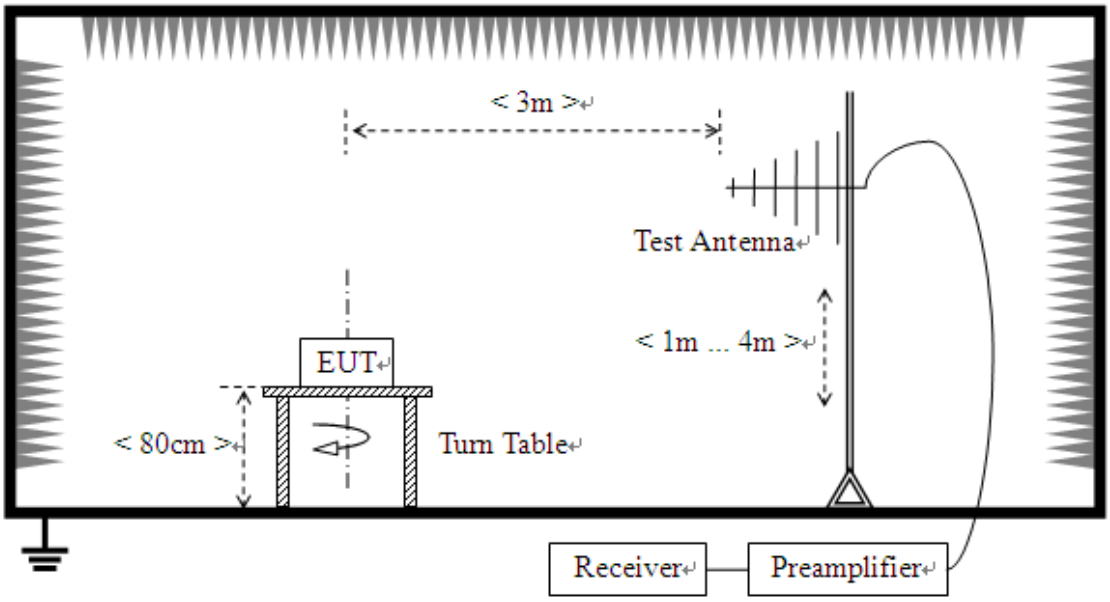
b) In the emission tables above, the tighter limit applies at the band edges.

2.3.2. Test Setup

1) For radiated emissions below 30MHz



2) For radiated emissions from 30MHz to1GHz



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 on a variable-height antenna master tower.

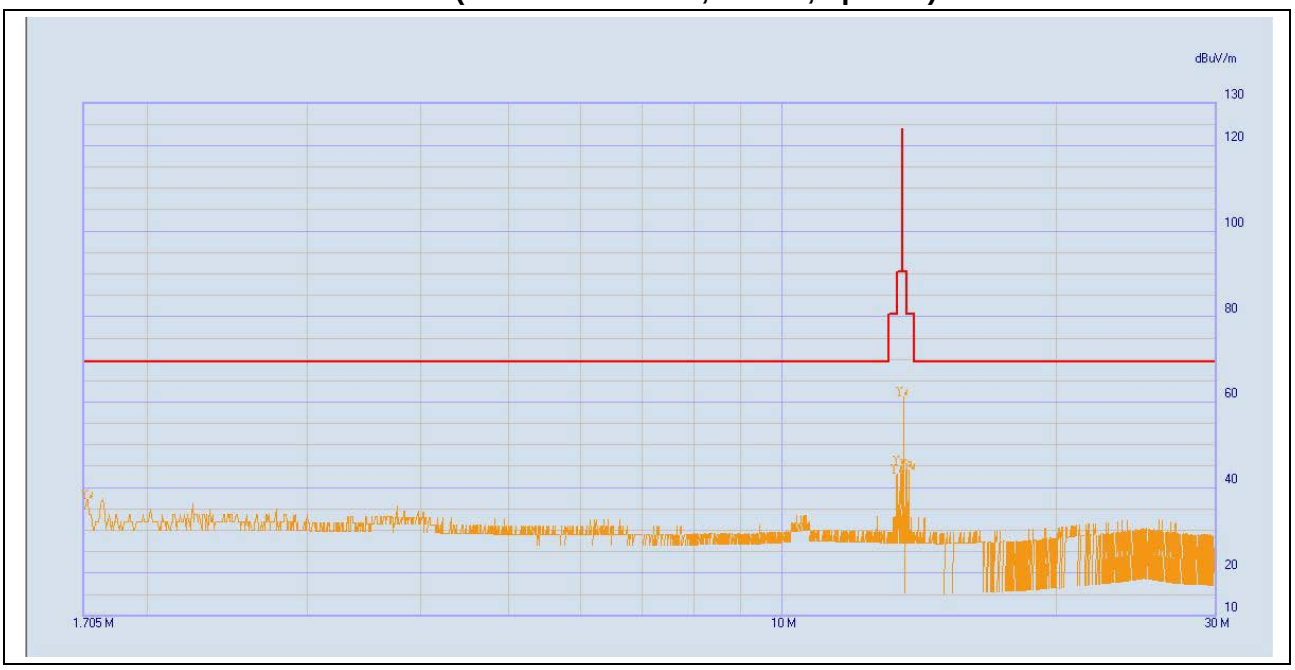
For the test Antenna:

In the frequency range of 9 kHz 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.

In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) was 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.

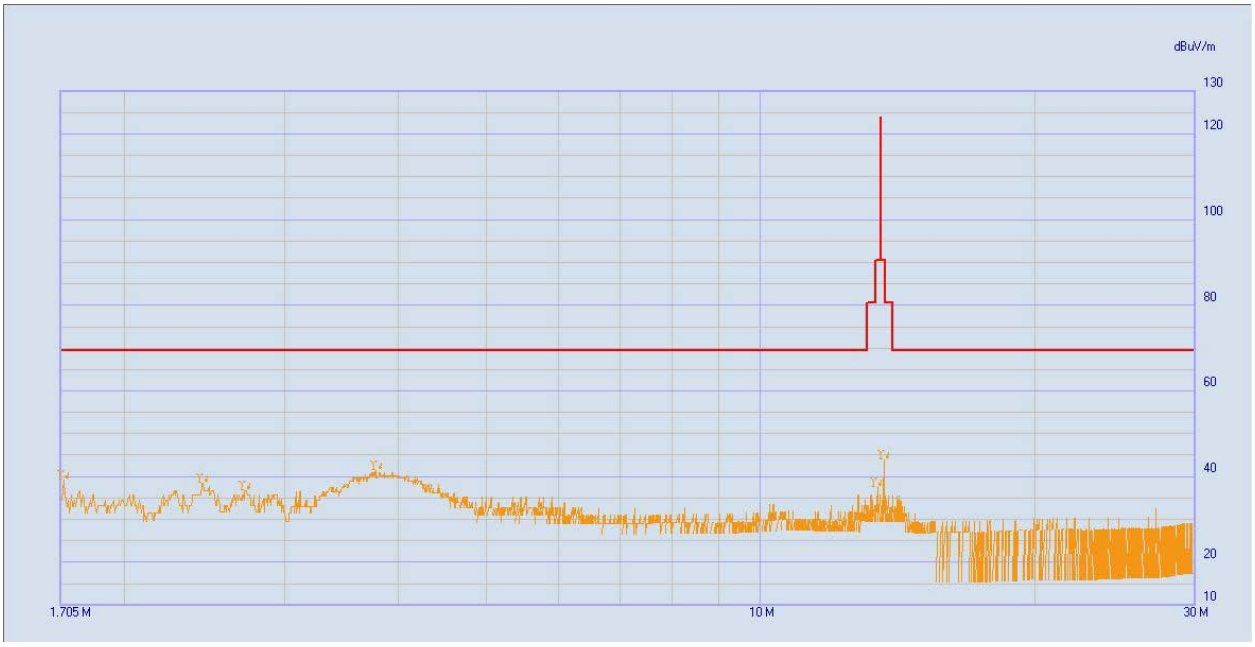
2.3.3. Test Result

A. Radiated Emission <30MHz (1.075MHz-30MHz, E-field, opened)



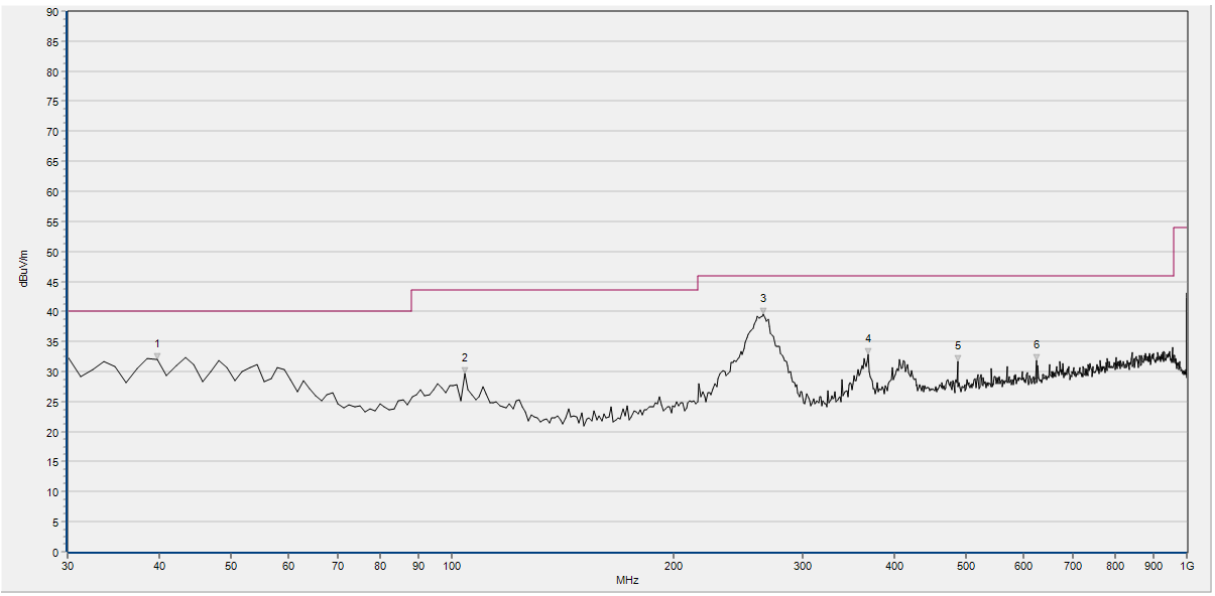
NO.	Frequency (MHz)	Detector Type	Level at 3m (dBμV/m)	Limit at 3m (dBμV/m)
1	1.72	Quasi Peak	37.17	69.5
2	13.35	Quasi Peak	43.12	80.5
3	13.45	Quasi Peak	45.14	90.5
4	13.56	Quasi Peak	61.20	124
5	13.66	Quasi Peak	44.35	90.5
6	13.775	Quasi Peak	43.93	80.5

B. Radiated Emission <30MHz (1.075MHz-30MHz, E-field, closed)



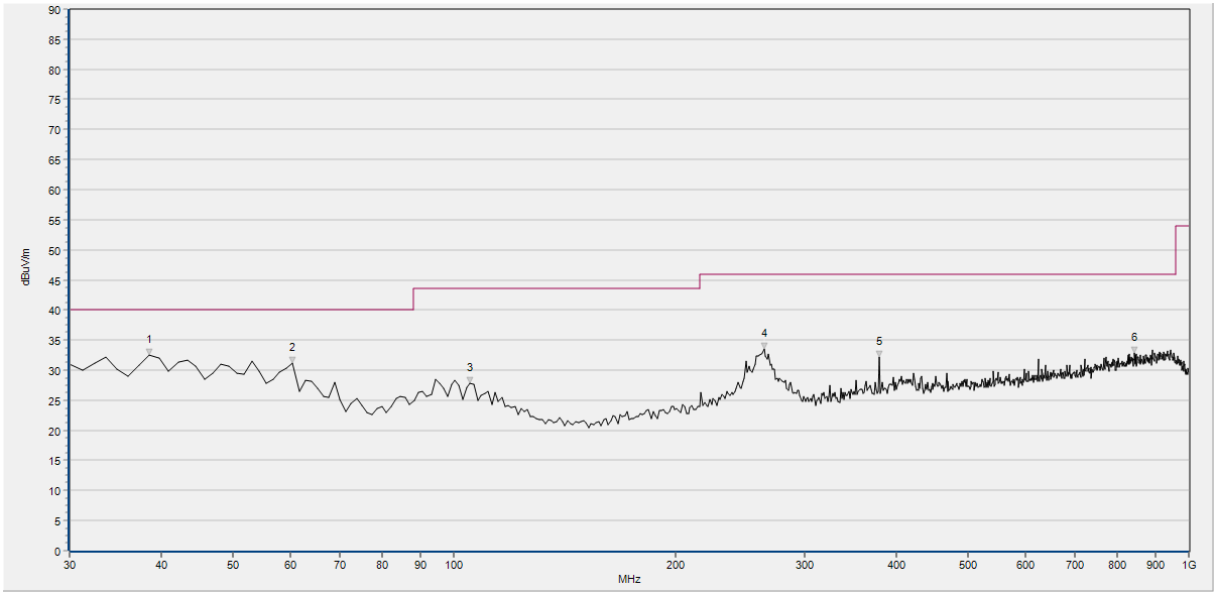
NO.	Frequency (MHz)	Detector Type	Level at 3m (dBμV/m)	Limit at 3m (dBμV/m)
1	1.715	Quasi Peak	39.10	69.5
2	2.435	Quasi Peak	38.46	69.5
3	2.715	Quasi Peak	36.76	69.5
4	3.78	Quasi Peak	41.44	69.5
5	13.395	Quasi Peak	37.53	80.5
6	13.645	Quasi Peak	43.96	90.5

C. Radiated Emission >30MHz (30MHz-1GHz)



(30MHz – 1GHz, 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	39.712	32.01	N/A	N/A	N/A	40.00	N/A	H	PASS
2	104.055	29.74	N/A	N/A	N/A	43.50	N/A	H	PASS
3	265.519	39.60	N/A	N/A	N/A	46.00	N/A	H	PASS
4	368.711	32.79	N/A	N/A	N/A	46.00	N/A	H	PASS
5	487.685	31.61	N/A	N/A	N/A	46.00	N/A	H	PASS
6	623.655	31.84	N/A	N/A	N/A	46.00	N/A	H	PASS



(30MHz – 1GHz, Test Antenna Vertical)

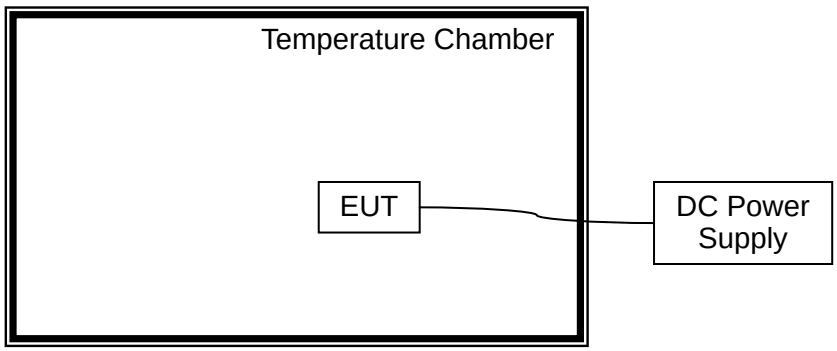
No.	Fre. MHz	PK dBµV/m	QP dBµV/m	AV dBµV/m	Limit-PK dBµV/m	Limit-QP dBµV/m	Limit-AV dBµV/m	ANT	Verdict
1	38.498	32.54	N/A	N/A	N/A	40.00	N/A	V	PASS
2	60.350	31.09	N/A	N/A	N/A	40.00	N/A	V	PASS
3	105.269	27.89	N/A	N/A	N/A	43.50	N/A	V	PASS
4	264.305	33.56	N/A	N/A	N/A	46.00	N/A	V	PASS
5	379.637	32.12	N/A	N/A	N/A	46.00	N/A	V	PASS
6	843.392	32.79	N/A	N/A	N/A	46.00	N/A	V	PASS

2.4. Frequency Tolerance

2.4.1. Test Requirement

According to FCC section 15.225, the devices operating in the 13.553~13.567 MHz shall maintain the carrier frequency within 0.01% of the operating frequency over the temperature variation of -20°C to +50°C using an environmental chamber. The primary supply voltage is varied from 85% to 115% of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

2.4.2. Test Setup



The EUT, which is powered by the DC Power Supply directly, is located in the Temperature Chamber. The EUT was measured by transmitter mode continuously.

2.4.3. Test Result

Operating Frequency: 13.56 MHz
Deference Voltage: 3.8V
Deviant Limit: ±0.01%

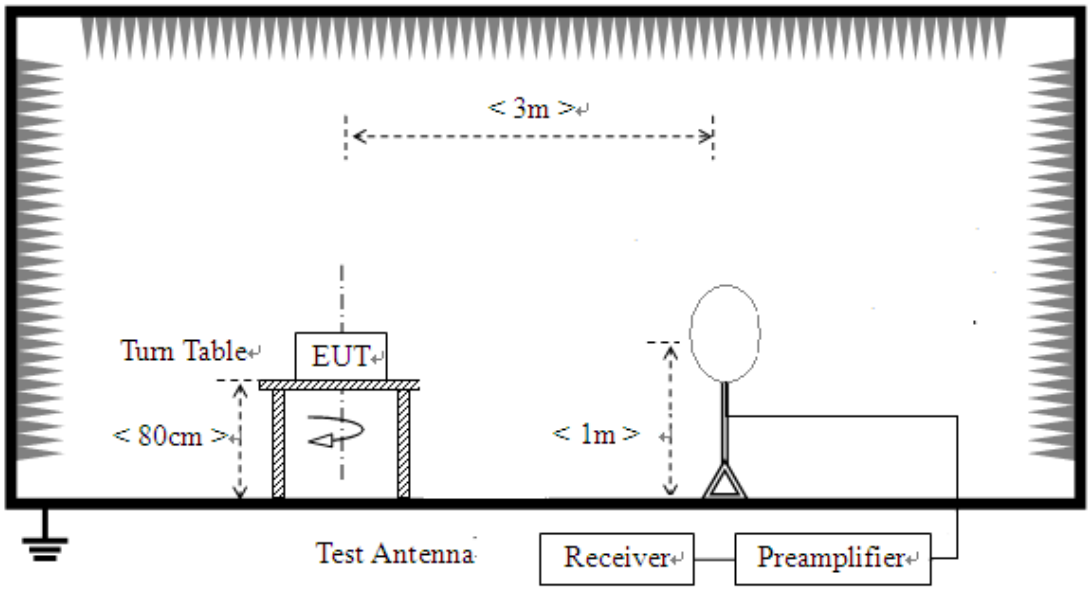
VOLTAGE (%)	Test Conditions		Frequency(MHz)	Deviation (%)	Verdict
	Power (VDC)	Temperature (°C)			
100	3.8	+20	13.560142	0.001047	
100		-20	13.560234	0.001726	PASS
100		-10	13.560227	0.001674	
100		0	13.560158	0.001165	
100		+10	13.560185	0.001364	
100		+20	13.560131	0.000966	
100		+25	13.560211	0.001556	
100		+30	13.560223	0.001645	
100		+40	13.560236	0.001740	
100		+50	13.560314	0.002316	
Battery End Point	3.6	+20	13.560185	0.001364	
115	4.35	+20	13.560176	0.001298	

2.5. 20dB Bandwidth

2.5.1. 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.

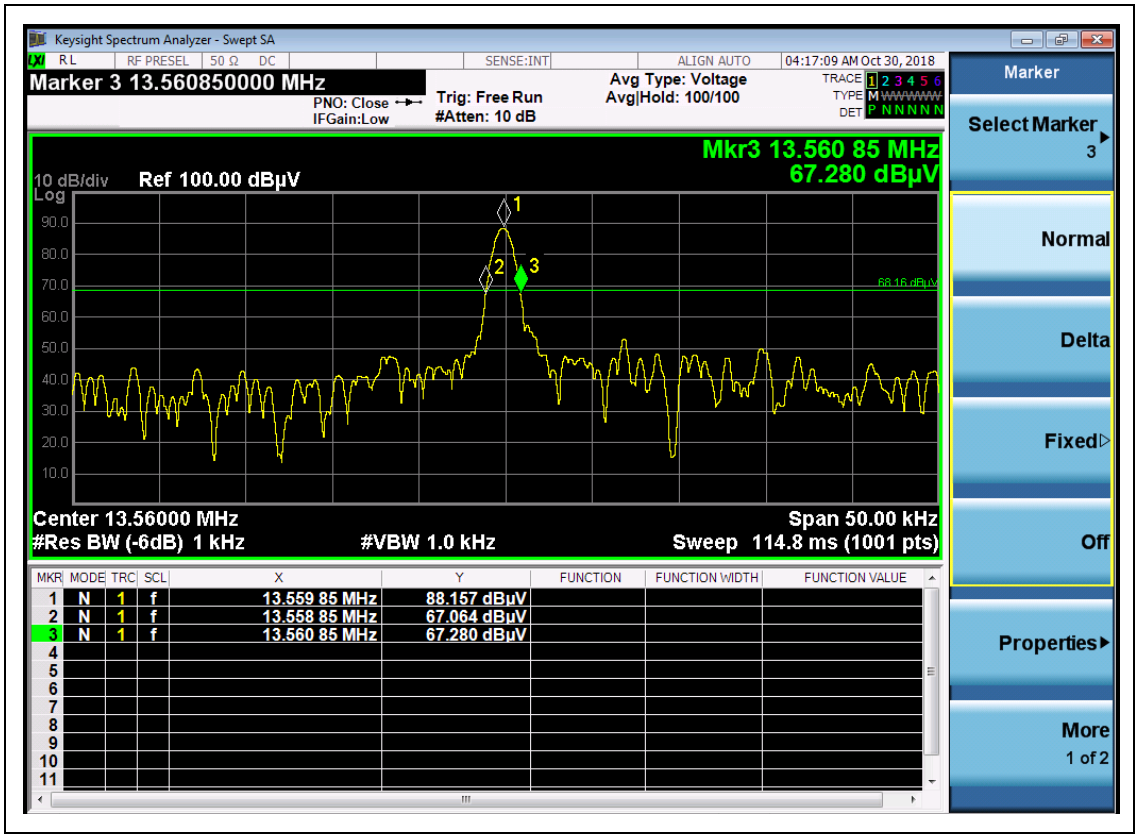
2.5.2. Test Setup



2.5.3. Test Result

Centre Frequency	Measurement		Limit		Verdict
	20dB Bandwidth (kHz)	Frequency Range (MHz)	20dB Bandwidth (kHz)	Frequency Range(MHz)	
13.56MHz	2	13.5589 to 13.5609	14	13.553 to 13.567	Pass

Test 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.

Radiated Emission:	±3.1dB
Conducted Emission:	±1.8dB
Bandwidth	±5%
Frequency Tolerance	±5%

Annex B 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. Facilities and Accreditations

All measurement facilities used to collect the measurement data are located at FL.3, Building A, FeiYang Science Park, Block 67, BaoAn District, Shenzhen, 518101 P. R. China. The test site is constructed in conformance with the requirements of ANSI C63.10-2013 and CISPR Publication 22; the FCC designation number is CN1192, the test firm registration number is 226174.

4. Test Equipments Utilized

4.1 Test Equipments

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Receiver	KEYSIGHT	N9038A	MY56400093	2018.05.08	2019.05.07
LISN	Schwarzbeck	NSLK 8127	812744	2018.05.08	2019.05.07
Pulse Limiter (20dB)	Schwarzbeck	VTSD 9561-D	9391	2018.05.08	2019.05.07
Coaxial Cable	Morlab	EMC01	CB01	N/A	N/A
Coaxial Cable	Morlab	EMC02	CB02	N/A	N/A
Anechoic Chamber	CRT	9m*6m*6m	N/A	2017.11.19	2020.11.18
Temperature Chamber	YinHe Experimental Equip.	HL4003T	N/A	2018.04.17	2019.04.16
Test Antenna – Bi-Log	Schwarzbeck	VULB 9163	9163-519	2018.05.08	2019.05.07
Test Antenna -Loop	Schwarzbeck	FMZB 1519	1519-022	2018.03.03	2019.03.02
DC Power Supply	Good Will Instrument Co.,Ltd.	N/A	N/A	2018.04.17	2019.04.16

4.2 Test Software Utilized

Model	Version Number	Producer
TS+ -[JS32-CE]	Version 2.5.0.0	Tonscend
MORLAB EMCR V1.2	Version 1.0	MORLAB

END OF REPORT