REPORT No. : SZ15030028W11

FCC PART 15C TEST REPORT

APPLICANT	:	Group Sense Mobile-Tech Limited
PRODUCT NAME	:	WiFi PDA
MODEL NAME	:	DT4100
TRADE NAME	:	Group Sense Mobile-Tech Limited
BRAND NAME	:	Xplore
FCC ID	:	VRI-B217
STANDARD(S)	:	47 CFR Part 15 Subpart C
TEST DATE	:	2015-03-25 to 2015-04-08
ISSUE DATE	:	2015-04-13

SHENZHEN MORLAB COMMUNICATIONS TECHNOLOGY Co., Ltd.

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DIRECTORY

Change History		
Issue	Date	Reason for change
1.0	2015-04-13	First edition

Test Report Declaration

Applicant	Group Sense Mobile-Tech Limited
Applicant Address	Room 13-24, 2/F, Sino Industrial Plaza, 9 Kai Cheung Road, Kowloon Bay, Kowloon, Hong Kong
Manufacturer	Group Sense Mobile-Tech Limited
Manufacturer Address	Room 13-24, 2/F, Sino Industrial Plaza, 9 Kai Cheung Road, Kowloon Bay, Kowloon, Hong Kong
Product Name	WiFi PDA
Model Name	DT4100
Brand Name	Xplore
HW Version	PP1
SW Version	B217-V1.00.0009-20150302
Test Standards	47 CFR Part 15 Subpart C
Test Result	PASS

Tested by : Cai Junlong
Cai Junlong (Test Engineer)

Reviewed by : Xiao Xiong
Xiao Xiong (EMC Manager)

Approved by : Zeng Dexin
Zeng Dexin (Chief Engineer)

1. Technical Information

Note： Provide by applicant.

1.1. Applicant Information

Company： Group Sense Mobile-Tech Limited

Address： Room 13-24, 2/F, Sino Industrial Plaza, 9 Kai Cheung Road, Kowloon Bay, Kowloon, Hong Kong

1.2. Equipment under Test (EUT) Description

EUT Type:	WiFi PDA
Serial No:	(n.a., marked #1 by test site)
Hardware Version:	PP1
Software Version:	B217-V1.00.0009-20150302
Frequency Range:	13.553MHz~13.567MHz
Frequency:	13.56MHz
Channel Number:	1
Modulation Type:	ASK
Antenna Type:	FPCB Antenna
Antenna Gain:	0

Power supply:	**Battery**	
	Brand Name:	NIL
	Model No.:	BT-DT4000
	Serial No.:	(n.a. marked #1 by test site)
	Capacity:	2700mAh
	Rated Voltage:	3.7V
	Charge Limit:	5V
Ancillary Equipment :	**AC Adapter (Charger for Battery)**	
	Brand Name:	NIL
	Model No.:	S040EM1500230
	Serial No.:	(n.a. marked #1 by test site)
	Rated Input:	~ 100-240V, 50/60Hz,1200mA
	Rated Output:	⎓ 15V, 2300mA

NOTE:

1. The EUT is a WiFi PDA, It supports NFC, 5.8GHz, 2.4GHz Bluetooth band, WIFI(802.11a/b/g/n) band.Only NFC function was tested in this report.
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 C:

No.	Identity	Document Title
1	47 CFR Part 15(10-1-12 Edition)	Radio Frequency Devices

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

No.	Section	Description	Result
1	15.203	Antenna requirement	PASS
2	15.207	Conducted Emission	PASS
3	15.209 15.225(a)(b)(c)(d)	Radiated Emission	PASS
4	15.225(e)	Frequency Tolerance	PASS
5	15.215(c)	20dB Bandwidth	PASS

NOTE:

The tests were performed according to the method of measurements prescribed in ANSI C63.4-2009.

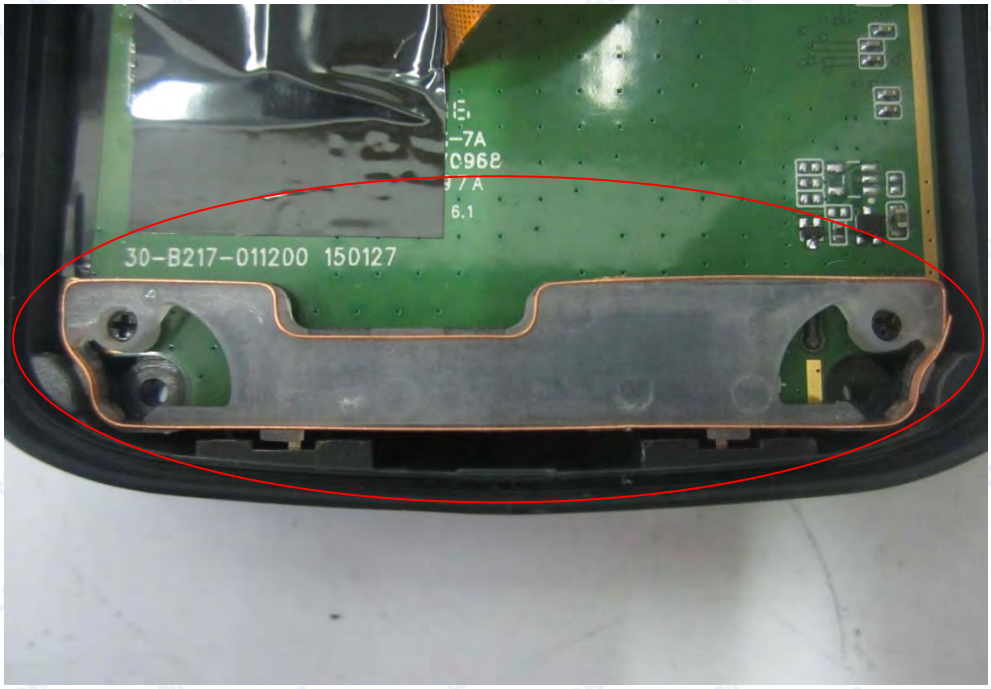
3. 47 CFR Part 15c Requirements

3.1. Antenna requirement

3.1.1. 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.

The EUT has a FPCB printed antenna for NFC module. Please refer to EUT photos for more photos.



Result: Compliant

3.2. Conducted Emission

3.2.1. 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)	
	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.

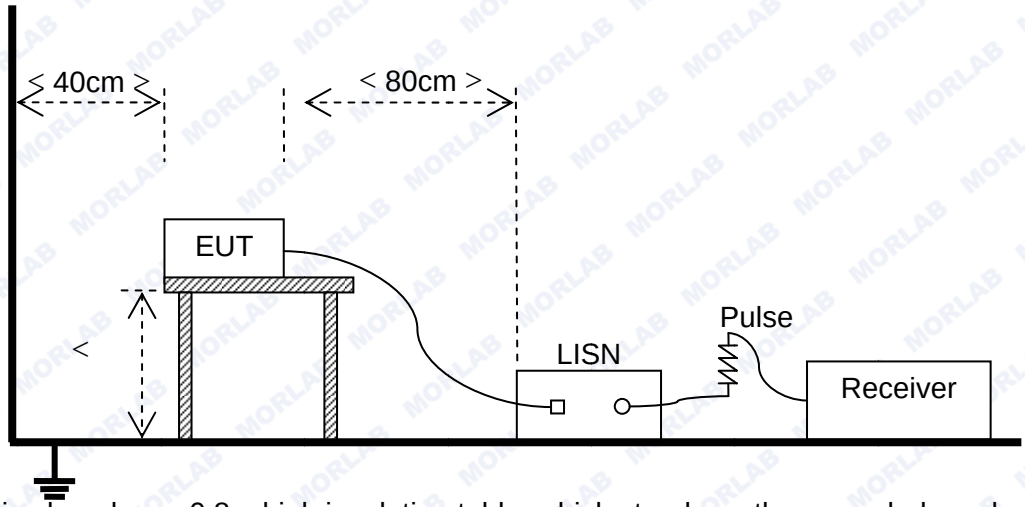
b) The lower limit shall apply at the band edges.

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

3.2.2. Test Equipment

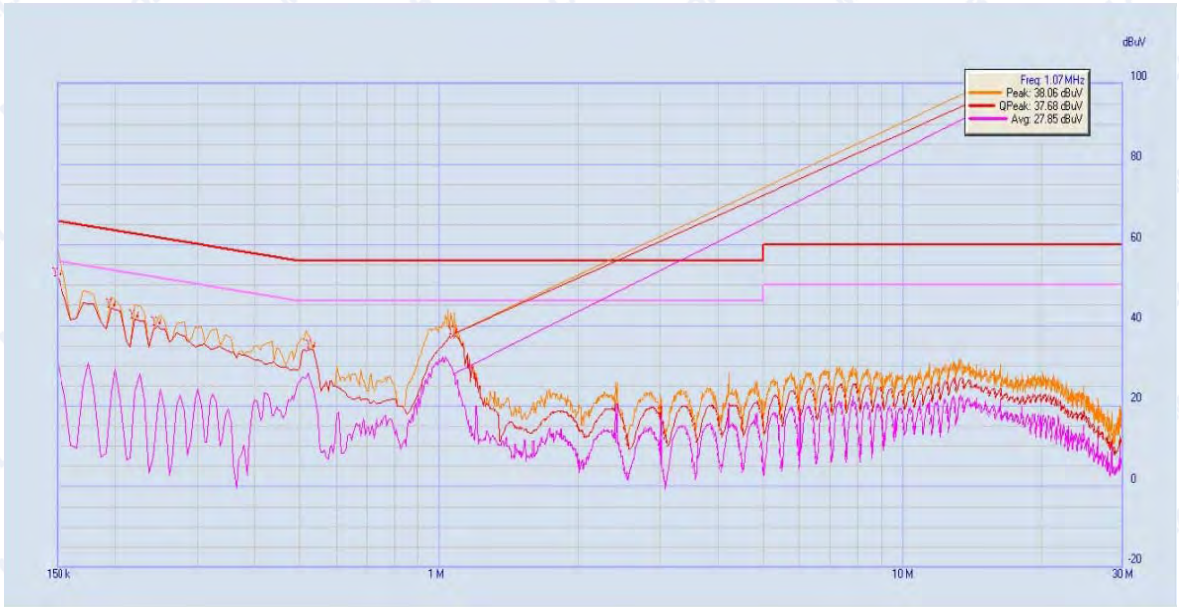
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Receiver	Narda	PMM 9060	001WX11001	2015.2.21	2016.2.20
Receiver	Narda	PMM 9010	595WX11007	2015.2.21	2016.2.20
LISN	Schwarzbeck	NSLK 8127	812744	2015.2.21	2016.2.20
Pulse Limiter (20dB)	Schwarzbeck	VTSD 9561-D	9391	(n.a.)	(n.a.)
Coaxial Cable	Morlab	EMC01	CB05	(n.a.)	(n.a.)

3.2.3. Test Setup



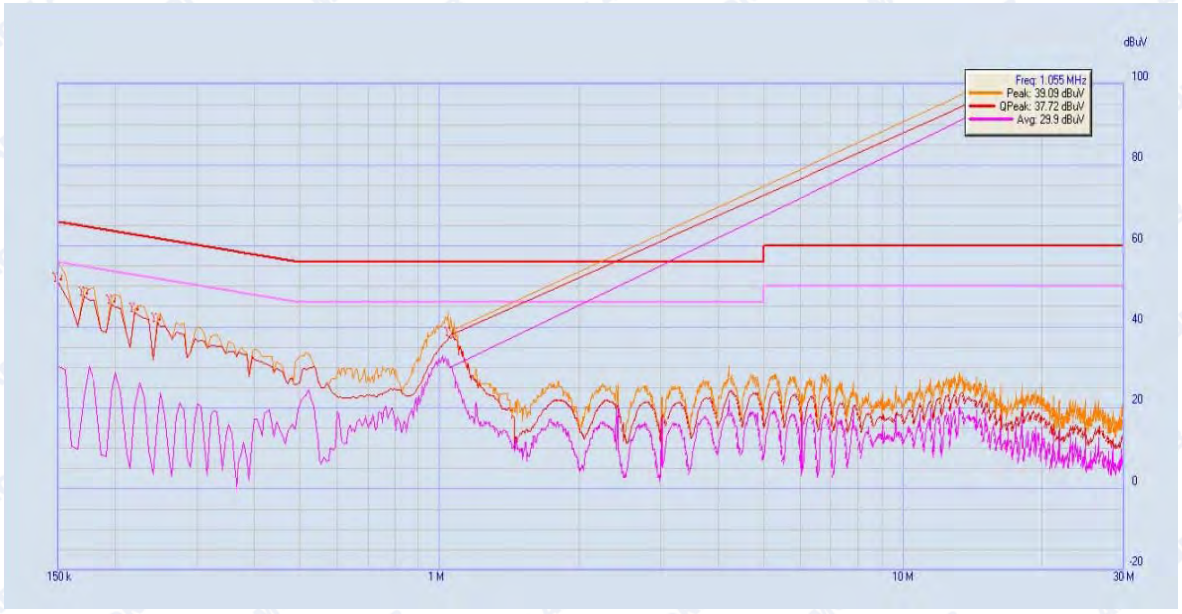
The EUT is placed on a 0.8m high insulating table, which stands on the grounded conducting floor, and keeps 0.4m away from the grounded conducting wall. The EUT is connected to the power mains through a LISN which provides 50Ω/50μH of coupling impedance for the measuring instrument. The RF Card is used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

3.2.4. Test Result



(Plot A: L Phase)

NO.	Fre. (MHz)	Emission Level (dBμV)		Limit (dBμV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.15	52.09	30.55	66.00	56.00	Line	PASS
2	0.195	44.40	23.47	64.71	54.71		PASS
3	0.22	41.56	23.49	64.00	54.00		PASS
4	0.245	39.96	19.83	63.29	53.29		PASS
5	0.53	34.06	25.76	56.00	46.00		PASS
6	1.07	37.68	27.85	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	0.15	50.99	30.17	66.00	56.00	Neutral	PASS
2	0.17	47.52	22.77	65.43	55.43		PASS
3	0.195	45.57	23.95	64.71	54.71		PASS
4	0.22	43.53	20.40	64.00	54.00		PASS
5	0.245	41.16	17.60	63.29	53.29		PASS
6	1.055	37.72	29.90	56.00	46.00		PASS

Result: PASS

3.3. Radiated Emission

3.3.1. Test Requirement

A. Radiated Emission <30MHz (9KHz-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.

B. 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

Frequency range (MHz)	Field Strength	
	μV/m	dBμV/m
216 - 960	200	46
Above 960	500	54

NOTE:

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

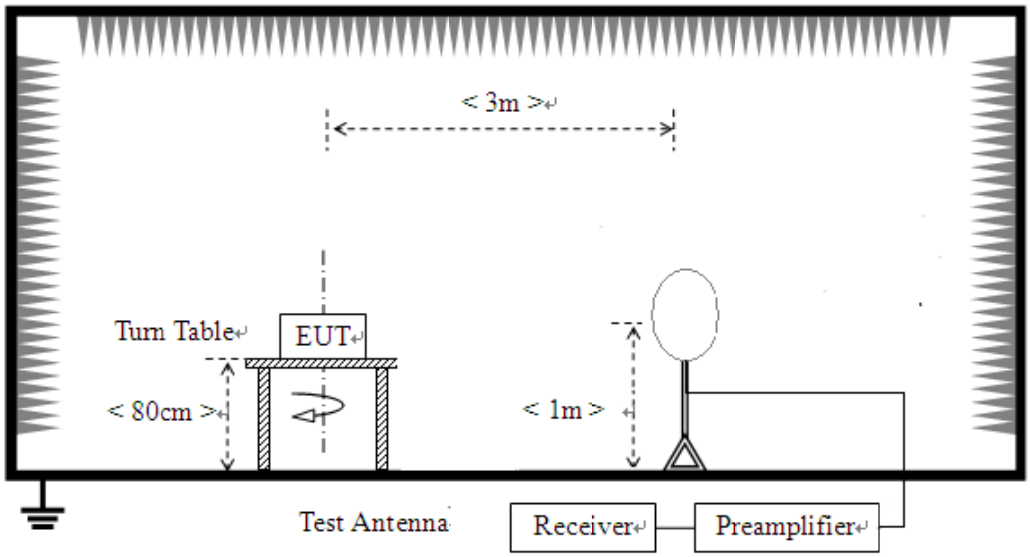
b) In the emission tables above, the tighter limit applies at the band edges.

3.3.2. Test Equipment

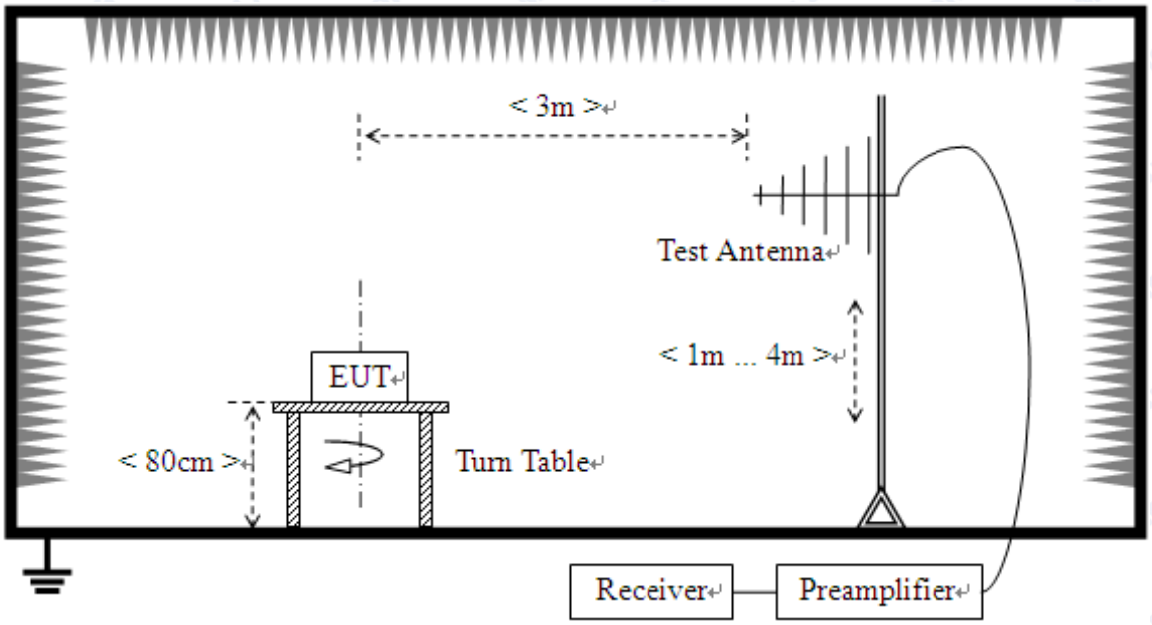
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
EMC Analyzer	Agilent	E7405A	US44210471	2015.2.21	2016.2.20
Receiver	Narda	PMM 9060	001WX11001	2015.2.21	2016.2.20
Receiver	Narda	PMM 9010	595WX11007	2015.2.21	2016.2.20
Semi-Anechoic Chamber	Albatross	9m*6m*6m	(n.a.)	2015.2.21	2016.2.20
Test Antenna - Bi-Log	Schwarzbeck	VULB 9163	9163-274	2015.2.25	2016.2.24
Test Antenna - Horn	Schwarzbeck	BBHA 9120D	9120D-963	2015.2.25	2016.2.24
Test Antenna -Loop	Schwarzbeck	FMZB 1519	1519-022	2015.2.25	2016.2.24
Coaxial Cable	Morlab	EMC02	CB06	(n.a.)	(n.a.)

3.3.3. Test Setup

1) For radiated emissions from 9kHz to 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.

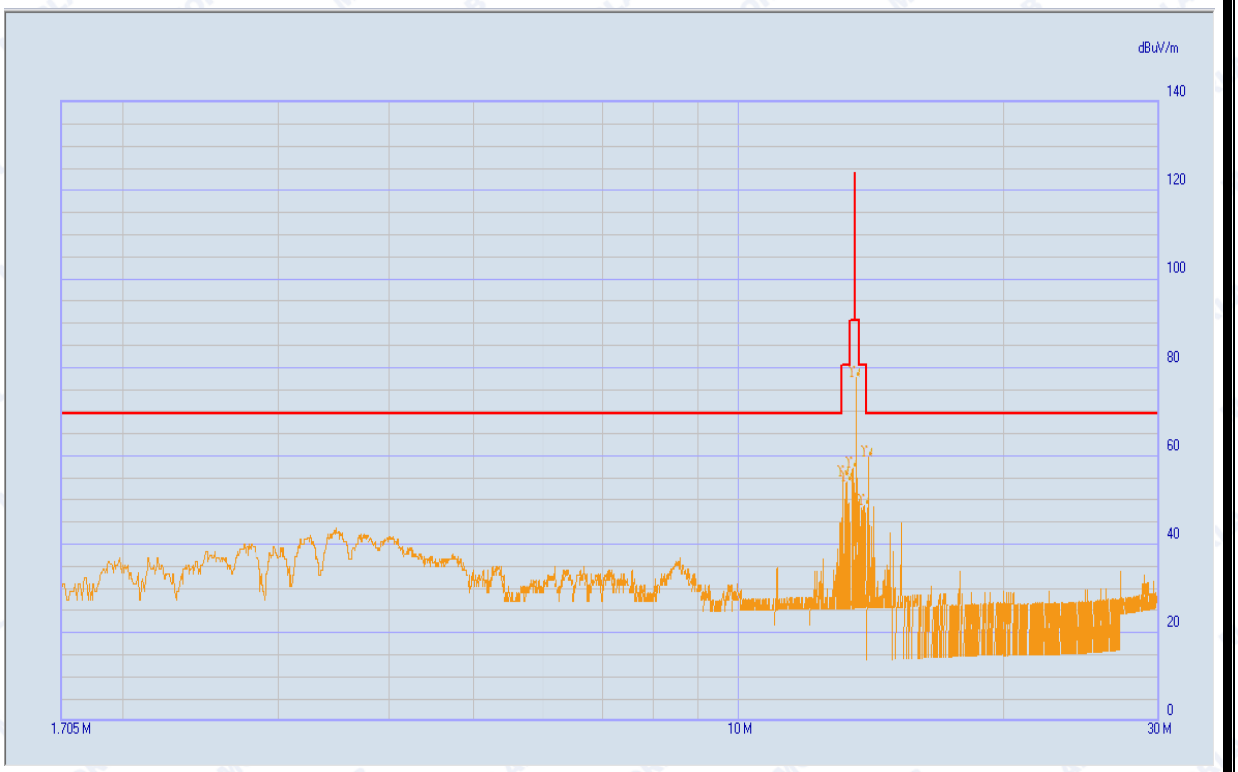
For the test Antenna:

1) 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.

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

3.3.4. Test Result

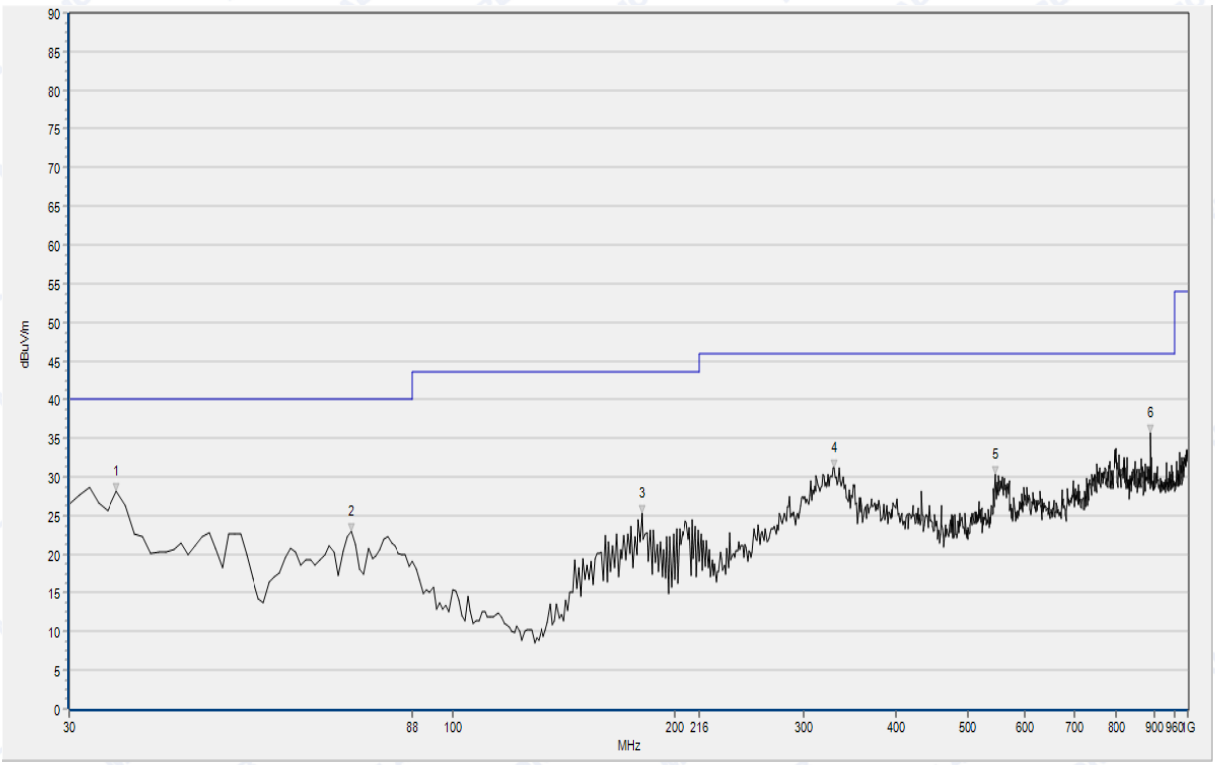
A. Radiated Emission <30MHz (1.075MHz-30MHz, E-field)



(Plot A: 1.075MHz – 30MHz)

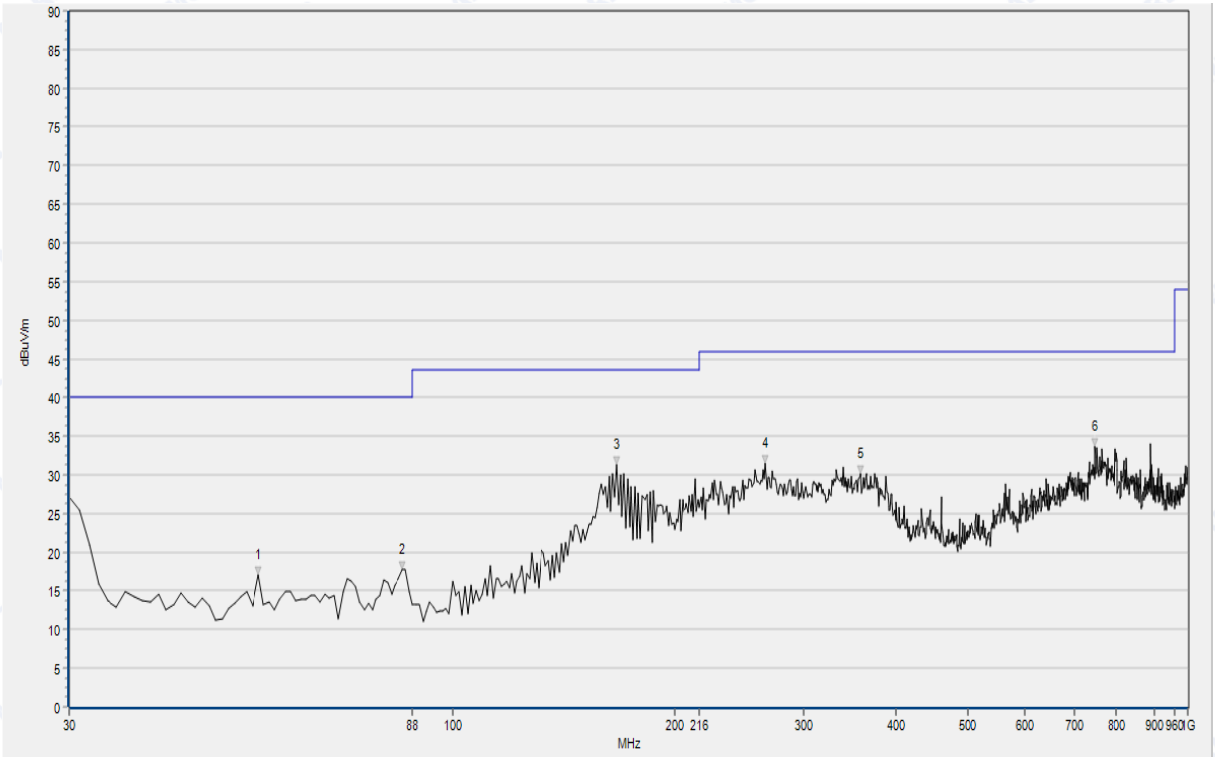
NO.	Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Verdict
1	13.12	N.A	55.14	N.A	N.A	80.5	N.A	Pass
2	13.24	N.A	54.14	N.A	N.A	80.5	N.A	Pass
3	13.43	N.A	57.06	N.A	N.A	90.5	N.A	Pass
4	13.56	N.A	77.59	N.A	N.A	124	N.A	Pass
5	13.86	N.A	48.71	N.A	N.A	80.5	N.A	Pass
6	13.985	N.A	59.81	N.A	N.A	80.5	N.A	Pass

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



(Plot B: 30MHz – 1GHz, Test Antenna Vertical)

NO.	Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
1	34.850	N.A	28.18	N.A	N.A	40.00	N.A	Vertical	Pass
2	72.680	N.A	22.90	N.A	N.A	40.00	N.A	Vertical	Pass
3	180.350	N.A	25.33	N.A	N.A	43.50	N.A	Vertical	Pass
4	329.730	N.A	31.11	N.A	N.A	46.00	N.A	Vertical	Pass
5	547.010	N.A	30.36	N.A	N.A	46.00	N.A	Vertical	Pass
6	891.360	N.A	35.75	N.A	N.A	46.00	N.A	Vertical	Pass



(Plot C: 30MHz – 1GHz, Test Antenna Horizontal)

NO.	Fre. (MHz)	Pk	QP	AV	Limit-PK	Limit-QP	Limit-AV	Antenna	Verdict
1	54.250	N.A	17.14	N.A	N.A	40.00	N.A	Horizontal	Pass
2	85.290	N.A	17.72	N.A	N.A	40.00	N.A	Horizontal	Pass
3	166.770	N.A	31.34	N.A	N.A	43.50	N.A	Horizontal	Pass
4	265.710	N.A	31.54	N.A	N.A	46.00	N.A	Horizontal	Pass
5	358.830	N.A	30.20	N.A	N.A	46.00	N.A	Horizontal	Pass
6	746.830	N.A	33.70	N.A	N.A	46.00	N.A	Horizontal	Pass

Result: PASS

3.4. Frequency Tolerance

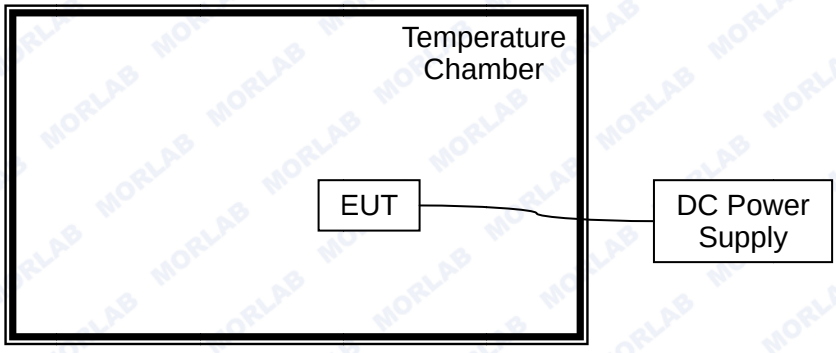
3.4.1. Test Requirement

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.

3.4.2. Test Equipment

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	Agilent	E7405A	US44210471	2015.2.21	2016.2.20
DC Power Supply	Good Will	GPS-3030DD	EF920938	2015.2.21	2016.2.20
Temperature Chamber	YinHe Experimental Equip.	HL4003T	(n.a.)	2015.2.21	2016.2.20
RF cable	Morlab	RF03	CB03	(n.a.)	(n.a.)

3.4.3. 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.

3.4.4. Test Result

Operating Frequency: 13,560,000 Hz

Deference Voltage: 3.7V

Deviant Limit: ±0.01%

Voltage(%)	Test Conditions		Frequency(Hz)	Deviation(%)	Verdict
	Power (VDC)	Temperature (°C)			
100	3.7	-20	13,559,685	-0.003652	PASS
100		-10	13,559,677	-0.002382	
100		0	13,559,652	-0.002566	
100		+10	13,559,614	-0.002845	
100		+20	13,559,562	-0.003229	
100		+25	13,559,553	-0.003297	
100		+30	13,559,544	-0.004401	
100		+40	13,559,551	-0.003311	
100		+50	13,560,579	+0.002569	
Battery End Point	3.6	+20	13,559,571	-0.003163	
115	4.2	+20	13,559,592	-0.004120	

3.5. 20dB Bandwidth

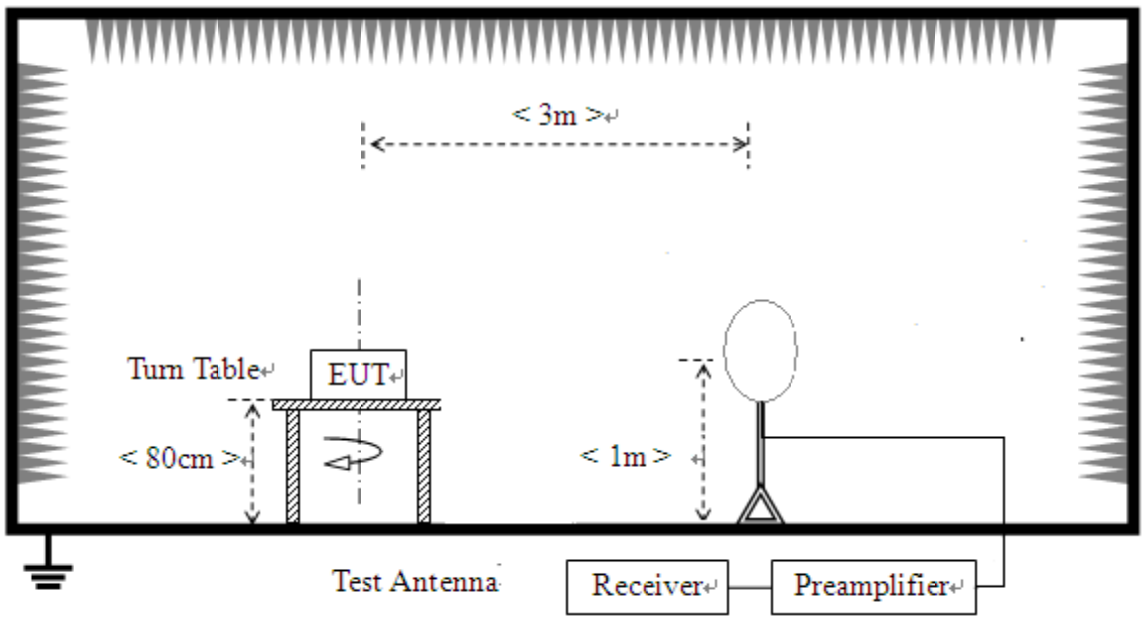
3.5.1. Test Requirement

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.

3.5.2. Test Equipment

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
EMC Analyzer	Agilent	E7405A	US44210471	2015.2.21	2016.2.20
Receiver	Narda	PMM 9060	001WX11001	2015.2.21	2016.2.20
Receiver	Narda	PMM 9010	595WX11007	2015.2.21	2016.2.20
Semi-Anechoic Chamber	Albatross	9m*6m*6m	(n.a.)	2015.2.21	2016.2.20
Test Antenna -Loop	Schwarzbeck	FMZB 1519	1519-022	2015.2.25	2016.2.24
Coaxial Cable	Morlab	EMC02	CB06	(n.a.)	(n.a.)

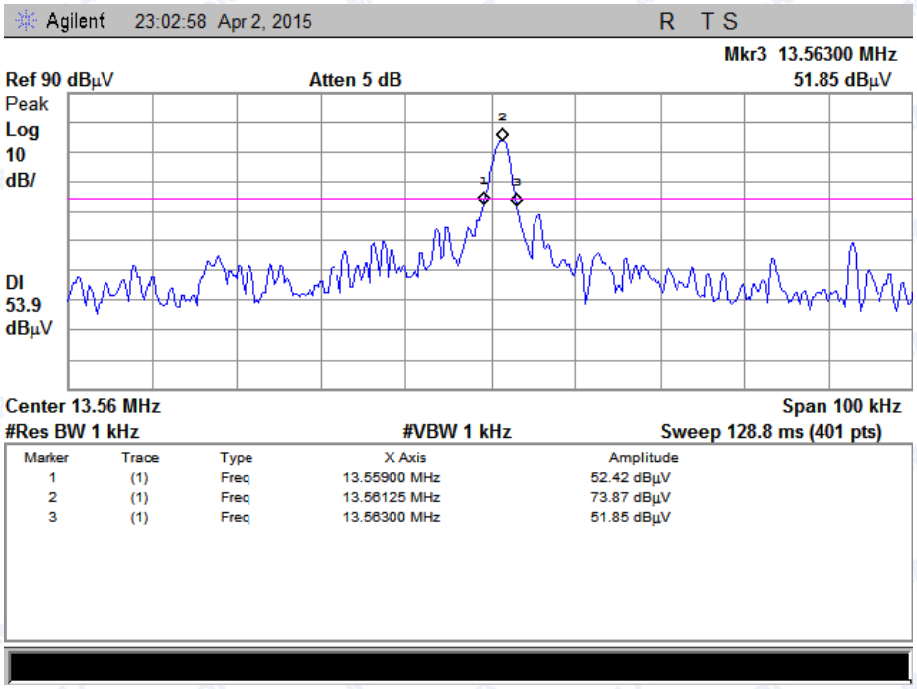
3.5.3. Test Setup



3.5.4. Test Result

Centre Frequency	Measurement		Limit		Verdict
	20dB Bandwidth (KHz)	Frequency Range (MHz)	20dB Bandwidth(KHz)	Frequency Range (MHz)	
13.56MHz	4.00	13.55900~13.56300	14	13.553~13.567	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:	±1.8dB
Uncertainty of Radiated Emission:	±3.1dB

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. Test Environment Conditions

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

Temperature (°C):	15 - 35
Relative Humidity (%):	20 - 75
Atmospheric Pressure (kPa):	86 - 106

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