

## FCC TEST REPORT

**Product** : mySwing  
**Trade mark** : N/A  
**Model/Type reference** : mySwing™ Basic Receiver  
**Serial number** : N/A  
**Ratings** : DC 1.5V  
**FCC ID** : Q2KMSWRX  
**Report number** : EESZE09070005-3  
**Date** : Sep. 19, 2012  
**Regulations** : See below

Test Standards	Results
<input checked="" type="checkbox"/> 47 CFR FCC Part 15 Subpart C 15.249:2011	PASS

Prepared for:  
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*N/A means not applicable.*

## 1. GENERAL INFORMATION

**Applicant:** Noitom Limited  
 Rm. 700, B&H Plaza, 1077 Nanhai Road, Shenzhen, China

**Manufacturer:** Noitom Limited  
 Rm. 700, B&H Plaza, 1077 Nanhai Road, Shenzhen, China

**Equipment authorization:** FCC Part 15 Certification

**FCC ID:** Q2KMSWRX

**Product:** mySwing

**Trade mark:** N/A

**Model/Type reference:** mySwing™ Basic Receiver

**Serial number:** N/A

**Report number:** EESZE09070005-3

**Sample Received Date:** Sep. 07, 2012

**Sample tested Date:** Sep. 07, 2012 to Sep. 19, 2012

The above equipment was tested by Centre Testing International for compliance with the requirements set forth in the FCC Rules and Regulations Part 15, Subpart C and the measurement procedure according to ANSI C63.4:2003.

## 2. TEST SUMMARY

No.	Test Item	Rule	Test Result
1	Radiated Emission	15.209 15.249(a) (d)	PASS
2	20dB Bandwidth	15.215(c)	PASS
3	Out of Band Emission	15.249(d)	PASS

## 3. MEASUREMENT UNCERTAINTY

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement items	Uncertainty
Radiated Emissions / Bandedge Emission	4.5 dB



## 4. PRODUCT INFORMATION

Items	Description
Rating	DC 1.5V
Intentional Transceiver	Intentional Transceiver
Frequency Channel	2406MHz, 2408MHz, 2410MHz, 2412MHz, 2414MHz, 2416MHz, 2418MHz, 2420MHz, 2422MHz, 2424MHz, 2426MHz, 2428MHz, 2430MHz, 2432MHz, 2434MHz, 2436MHz, 2438MHz, 2440MHz, 2442MHz, 2444MHz, 2446MHz, 2448MHz, 2450MHz, 2452MHz, 2454MHz, 2456MHz, 2458MHz, 2460MHz, 2462MHz, 2464MHz, 2466MHz, 2468MHz, 2470MHz, 2472MHz, 2474MHz, 2476MHz, 2478MHz, 2480MHz
Channel Number	38 (at intervals of 2MHz)
Antenna Type	PCB Antenna

## 5. SYSTEM TEST CONFIGURATION

### 5.1 Justification

For emissions testing, the equipment under test (Product) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables were manipulated to produce worst case emissions. It was powered by 1.5VDC. Only the worst case data were recorded in this test report.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

The EUT use new battery during the test.

### 5.2 Product Exercising Software

No special software used.

## 6. TEST EQUIPMENT LIST

Equipment	Manufacturer	Model Number	Serial Number	Due Date
3M Chamber & Accessory Equipment	ETS-LINDGREN	FACT-3	3510	07/09/2013
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	401	07/21/2013
Receiver	R&S	ESCI	100435	07/19/2013
Multi device Controller	ETS-LINGREN	2090	00057230	N/A
Horn Antenna	ETS-LINGREN	3117	00057407	07/07/2015
Spectrum Analyzer	Agilent	E4440A	MY46185649	03/07/2013
Microwave Preamplifier	CD	PAP-1G18G	2001	03/29/2013
Receiver	R&S	ESCI	100009	07/19/2013
LISN	R&S	ENV216	100098	07/19/2013
Double ridge horn antenna	A.H.SYSTEMS	SAS-574	6042	07/06/2015
Pre-amplifier	A.H.SYSTEMS	PAP-1840-60	6041	07/06/2015

## 7. SUPPORT EQUIPMENT LIST

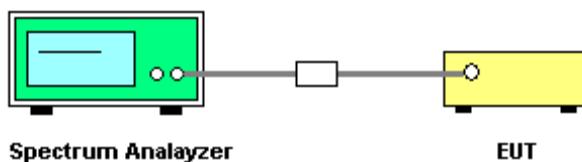
No special auxiliary equipment used.

## 8. 20DB BANDWIDTH MEASUREMENT

### 8.1. LIMITS

None

### 8.2. BLOCK DIAGRAM OF TEST SETUP

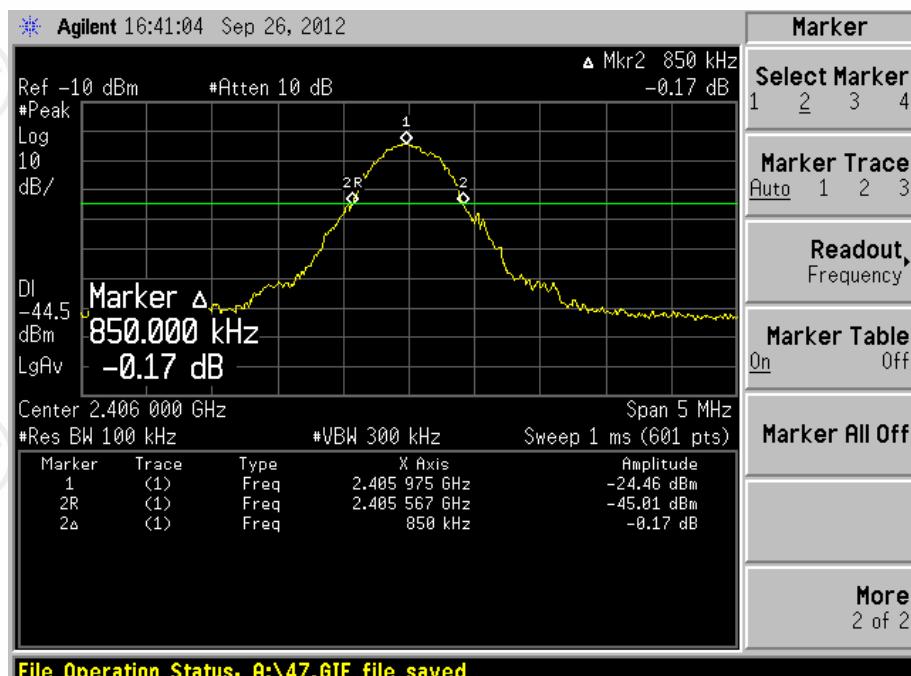


### 8.3. TEST PROCEDURE

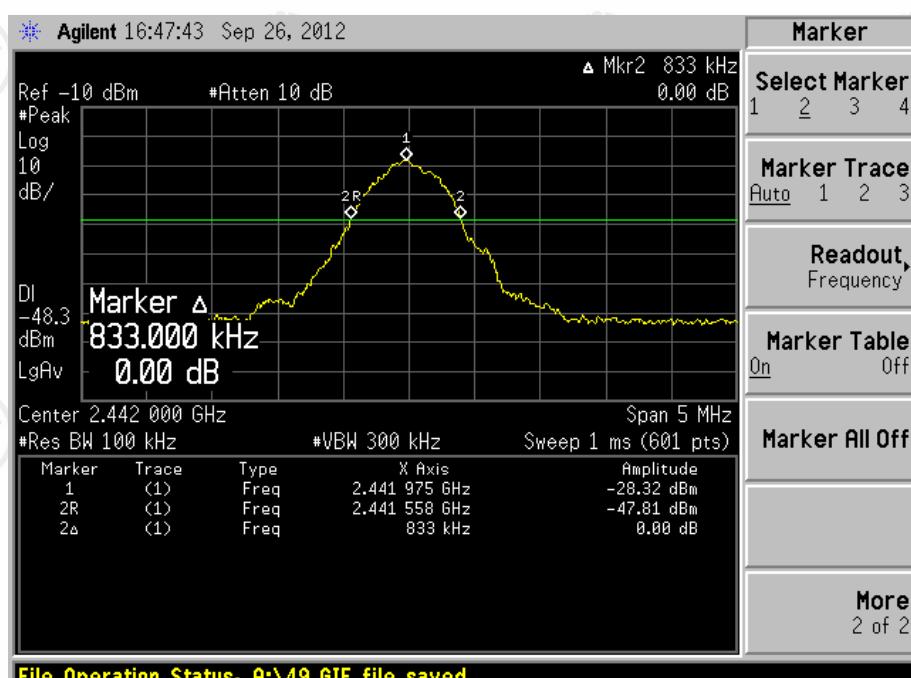
1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Set spectrum analyzer's RBW and VBW to applicable value with Peak in Max Hold.
3. A PEAK output reading was taken, a DISPLAY line was drawn 20 dB lower than PEAK level.
4. The 20dB bandwidth was determined from where the channel output spectrum intersected the display line.

### 8.4. TEST RESULT

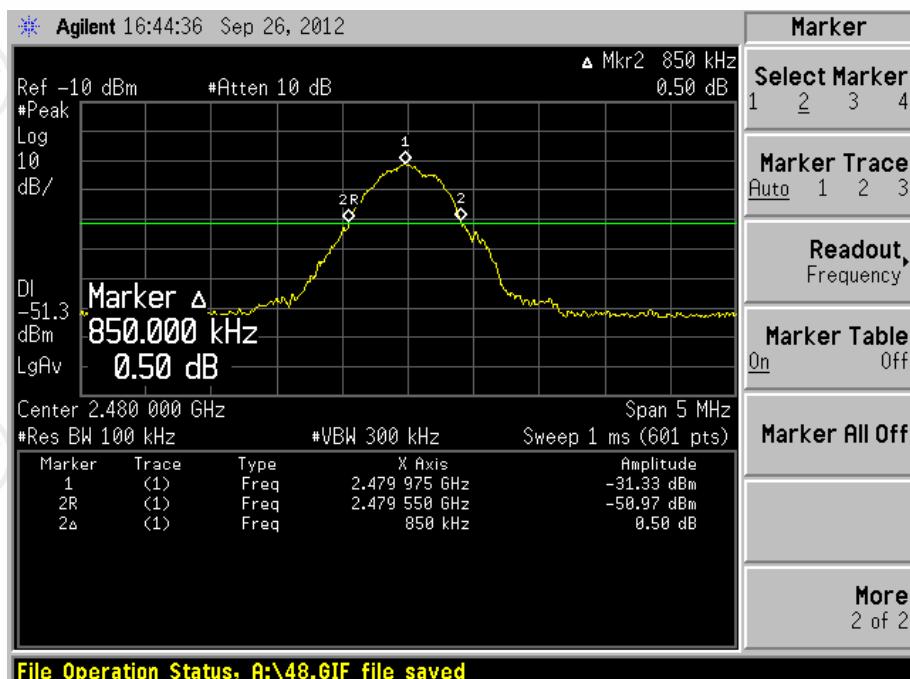
Frequency (MHz)	20 dB BW (MHz)	Result
2406	0.850	0.850MHz
2442	0.833	
2480	0.850	



2406 MHz



2442 MHz



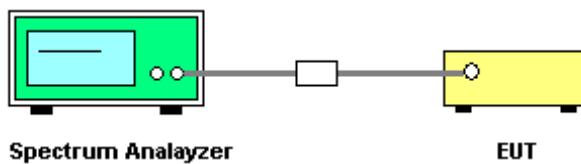
2480 MHz

## 9. OUT OF BAND EMISSION

### 9.1. LIMITS

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.

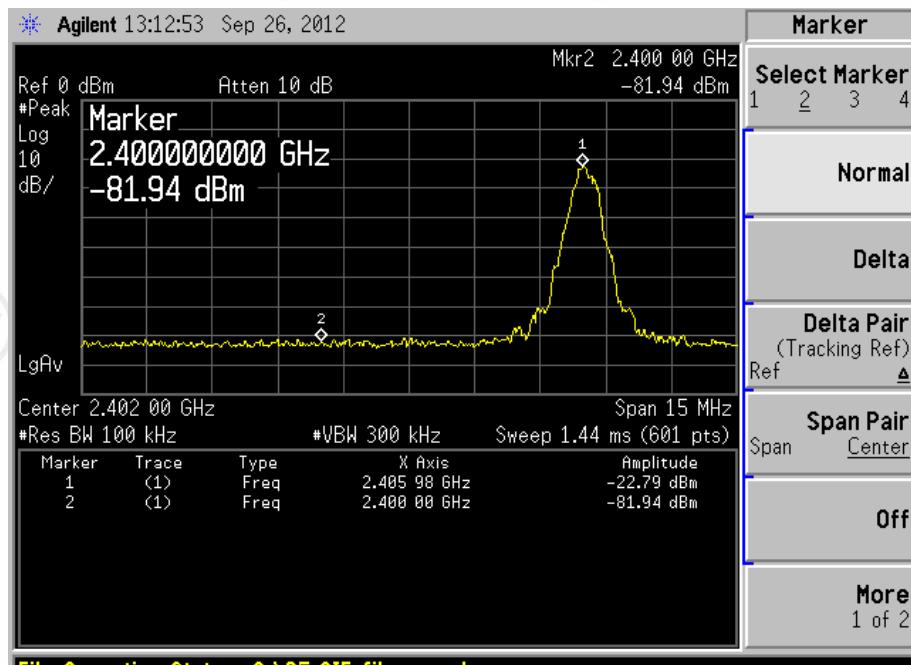
### 9.2. BLOCK DIAGRAM OF TEST SETUP



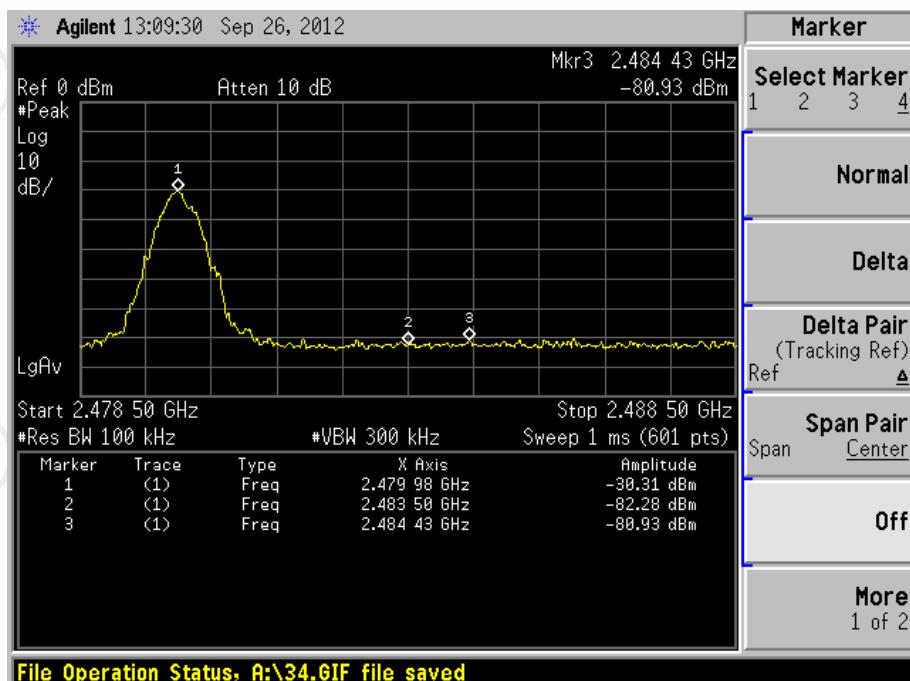
### 9.3. TEST PROCEDURE

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Set spectrum analyzer's RBW and VBW to applicable value with Peak in Max Hold.
3. Record the emission drops at the band-edge relative to the highest fundamental emission level.
4. Use the marker-delta method to determine band-edge compliance as required.

### 9.4. TEST RESULT



2406MHz



2480MHz

## 10. RADIATED EMISSIONS MEASUREMENT

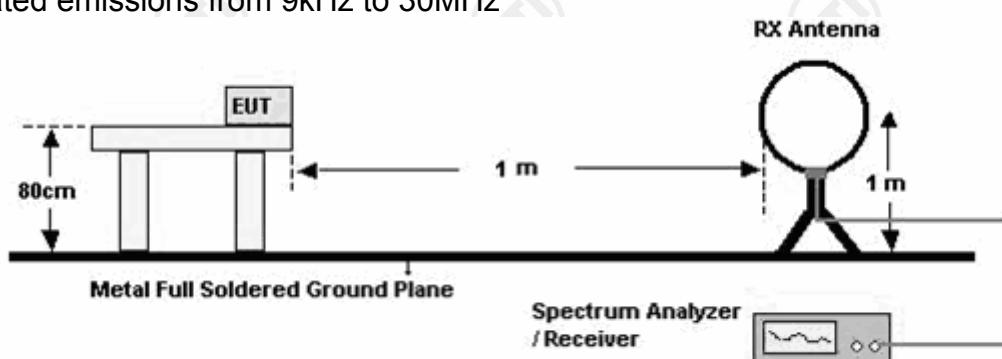
### 10.1. LIMITS

Fundamental Frequency (MHz)	Field strength of fundamental (dB $\mu$ V/m)		Field strength of harmonics (dB $\mu$ V/m)	
	PK	AV	PK	AV
2400-2483.5	114	94	74	54

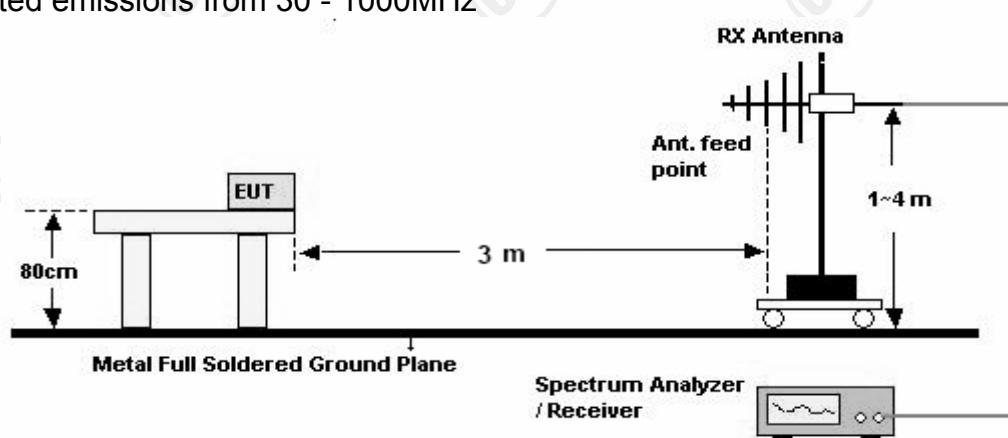
NOTE: For others frequency limits, refer to the § 15.209.

### 10.2. BLOCK DIAGRAM OF TEST SETUP

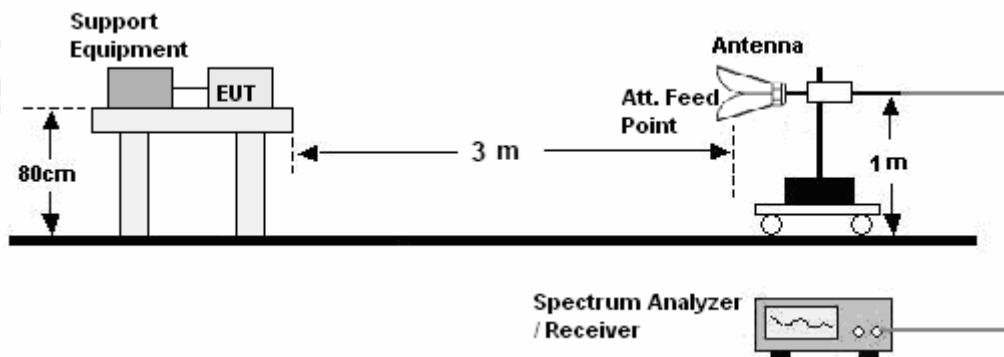
For radiated emissions from 9kHz to 30MHz



For radiated emissions from 30 - 1000MHz



For radiated emissions from 1GHz to 25GHz



### 10.3. TEST PROCEDURE

#### A. Above 30MHz

- The Product was placed on the top of a turntable 0.8 meters above the ground in the chamber, 3 meters away from the antenna (wideband antenna), which was mounted on the top of a variable-height antenna tower. The maximum values of the field strength are recorded by adjusting the polarizations of the test antenna and rotating the turntable.
- For each suspected emission, the Product was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the turn table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test frequency analyzer system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

#### B. Below 30MHz

- The Product is placed on a turntable 0.8 meters above the ground in the chamber, 1 meter away from the antenna (loop antenna). The maximum values of the field strength are recorded by adjusting the polarizations of the test antenna and rotating the turntable.
- For each suspected emission, the Product was arranged to its worst case and then turn table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test frequency analyzer system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

#### 10.4. TEST RESULT

Frequency (MHZ)	Antenna Polarization (H / V)	Detector (PK / QP / AV)	Final Emission ( dB $\mu$ V/m)	AV Limit (dB $\mu$ V/m)	Result (Pass / Fail)
498.833	H	QP	29.72	46.0	Pass
757.500	H	QP	34.55	46.0	Pass
2406.000	H	PK	73.27	94.0	Pass
3716.667	H	PK	29.79	54.0	Pass
427.700	V	QP	28.25	46.0	Pass
484.283	V	QP	28.61	46.0	Pass
2406.000	V	PK	80.65	94.0	Pass
3908.333	V	PK	29.18	54.0	Pass

2406MHz

Frequency (MHZ)	Antenna Polarization (H / V)	Detector (PK / QP / AV)	Final Emission ( dB $\mu$ V/m)	AV Limit (dB $\mu$ V/m)	Result (Pass / Fail)
636.250	H	QP	31.11	46.0	Pass
859.350	H	QP	35.65	46.0	Pass
2442.000	H	PK	77.10	94.0	Pass
4641.667	H	PK	29.37	54.0	Pass
830.250	V	QP	36.08	46.0	Pass
860.966	V	QP	36.05	46.0	Pass
2442.000	V	PK	80.10	94.0	Pass
3650.000	V	PK	29.37	54.0	Pass

2442MHz

Frequency (MHZ)	Antenna Polarization (H / V)	Detector (PK / QP / AV)	Final Emission ( dB $\mu$ V/m)	AV Limit (dB $\mu$ V/m)	Result (Pass / Fail)
224..000	H	QP	30.76	46.0	Pass
427.700	H	QP	31.58	46.0	Pass
2480.000	H	PK	76.28	94.0	Pass
4960.000	H	PK	32.37	54.0	Pass
744.566	V	QP	34.11	46.0	Pass
864.200	V	QP	36.00	46.0	Pass
2480.000	V	PK	79.41	94.0	Pass
4960.000	V	PK	34.50	54.0	Pass

2480MHz

**Note 1:** The above tables show that the frequencies peak data are all below the average limit, so the average data of these frequencies are deemed to fulfill the average limits and not reported.

**Note 2:** The emissions below 30MHz are not reported for they are much lower than the limits.

## APPENDIX 1 PHOTOGRAPHS OF TEST SETUP



TEST SETUP OF RADIATED EMISSION (30MHZ-1GHZ)



TEST SETUP OF RADIATED EMISSION (ABOVE 1GHZ)

## APPENDIX 2 EXTERNAL PHOTOGRAPHS OF PRODUCT



View of Product-1



View of Product-2

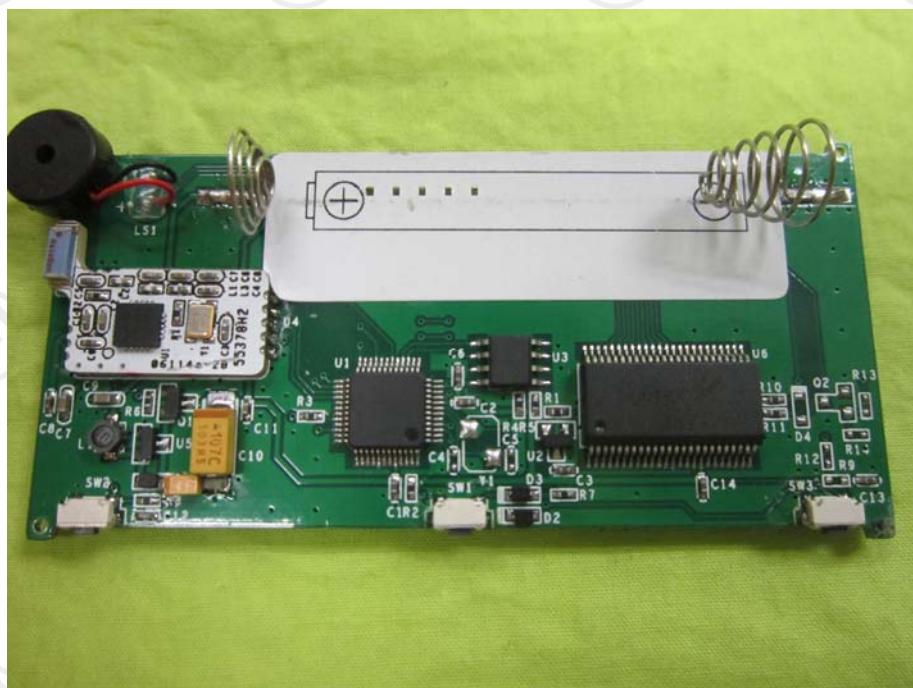


View of Product-3

### APPENDIX 3 INTERNAL PHOTOGRAPHS OF PRODUCT



Internal View of EUT



Front View of PCB



Rear View of PCB

\*\*\* End of report \*\*\*

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