

## TEST REPORT

<b>Applicant:</b>	Ngai Lik Electronics Enterprises Limited
<b>Address of Applicant:</b>	Flat 29-32, 8/F., Block B, Focal Industrial Centre, 21 Man Lok Street, Hung Kowloon, Hong Kong.
<b>Manufacturer:</b>	Ngai Lik Electronics Enterprises Limited
<b>Address of Manufacturer:</b>	Flat 29-32, 8/F., Block B, Focal Industrial Centre, 21 Man Lok Street, Hung Kowloon, Hong Kong.
<b>Product name:</b>	iPhone Tx
<b>Model:</b>	WTX001A, NiAA300b
<b>Rating(s):</b>	3.3Vdc 100mA
<b>Trademark:</b>	Nyrius
<b>FCC test lab register number:</b>	935596
<b>FCC ID:</b>	Y8AWTX001A
<b>Operating frequency range:</b>	2404.8~2474.5 MHz
<b>Standards:</b>	<b>FCC Part 15.249:</b> Operation within the bands 920-928 MHz, 2400-2483.5 MHz, 5725-5850 MHz and 24.0 - 24.25 GHz.
<b>Data of Receipt:</b>	2011-04-21
<b>Date of Test:</b>	2011-04-27
<b>Date of Issue:</b>	2011-05-05
<b>Test Result</b>	<b>Pass*</b>

\* In the configuration tested, the test item complied with the standards specified above.

### Authorized for issue by:

#### Test by:

May.05.2011 Jummy Qiu

Project Engineer

Date

Name/Position

Signature

#### Reviewed by:

May.05.2011

Pauler Li

Project Engineer

Date

Name/Position

Signature

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**Testing Laboratory information:**

Testing Laboratory Name ..... : I-Test Laboratory  
Address ..... : 1-2 floor, South Block, Building A2 , No 3 Keyan Lu, Science City,  
Guangzhou, Guangdong Province, P.R. China  
Testing location ..... : Same as above  
Tel..... : 0086-20-32209330  
Fax ..... : 0086-20-62824387  
E-mail ..... : itl@i-testlab.com

**Possible test case verdicts:**

- test case does not apply to the test object... : N/A
- test object does meet the requirement..... : P (Pass)
- test object does not meet the requirement . : F (Fail)

**General remarks:**

**The test results presented in this report relate only to the object tested.**

**The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.**

This report would be invalid test report without all the signatures of testing technician and approver.

This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

**General product information:**

The applied models WTX001A and NiAA300b are the same except model name. All the tests are carried out on model NiAA300b.

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# 1.TEST STANDARDS

The tests were performed according to following standards:

[FCC Rules Part 15.249:](#) Operation within the bands 902 - 928 MHz, 2400 - 2483.5 MHz, 5725 - 5875 MHz, and 24.0 - 24.25 GHz.

[ANSI C63.4-2009](#)

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## 2 SUMMARY

### 2.1 Equipment Under Test

#### Power supply system utilised

Power supply voltage : ☐ 120V / 60 Hz ☐ 115V / 60Hz  
☐ 12 V DC ☐ 24 V DC  
☒ Other (specified in blank below)

DC 3.3V from ipod

### 2.2 Short description of the Equipment under Test (EUT)

Wireless Tx at 2404.8~2474.5 MHz.

Modulation: GFSK

Antenna type: PCB Antenna

For more details, refer to the user's manual of the EUT.

Serial number: N/A

### 2.3 EUT operation mode

The EUT has been tested under typical operating condition (continue emission).

### 2.4 EUT configuration

**The following peripheral devices and interface cables were connected during the measurement:**

☐ - supplied by the manufacturer

☒ - supplied by the lab

☐ Power Cable

Length (m) : /

Shield : /

Detachable : /

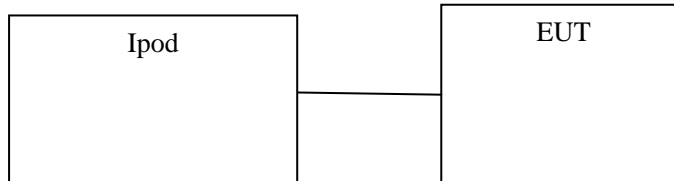
☒ Ipod

Manufacturer : Apple

Model No. : A1320

## 2.5 Configuration of Tested System

### Configuration of Tested System



### Equipment Used in Tested System

No.	Product	Manufacturer	Model No.	Serial No.	FCC ID
1	Ipod	Apple	A1320	YM0133J572F	/

## 2.5 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID **Y8AWTX001A**: filing to comply with Section 15.249 of the FCC Part 15, Subpart C Rules.

## 2.7 Modifications

No modifications were implemented to meet testing criteria.

## 3 TEST ENVIRONMENT

### 3.1 Address of the test laboratory

1-2/F., South Block, Building A2, No.3, Keyan Road, Science City, Guangzhou, Guangdong, China

### 3.2 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

**IC Registration No.: 8368A**

**FCC-Registration No.: 935596**

**CNAS No.:L4957**

### 3.3 Environmental conditions

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

Temperature:	<u>15-35 ° C</u>
Humidity:	<u>30-60 %</u>
Atmospheric pressure:	<u>950-1050mbar</u>

### 3.4 Statement of the measurement uncertainty

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	3.35dB	(1)
Radiated Emission	1~18GHz	4.32dB	(1)
Conducted Disturbance	0.15~30MHz	2.30dB	(1)

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

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### 3.5 Equipments Used during the Test

For Radiated Spurious Emission(30MHz~18GHz)

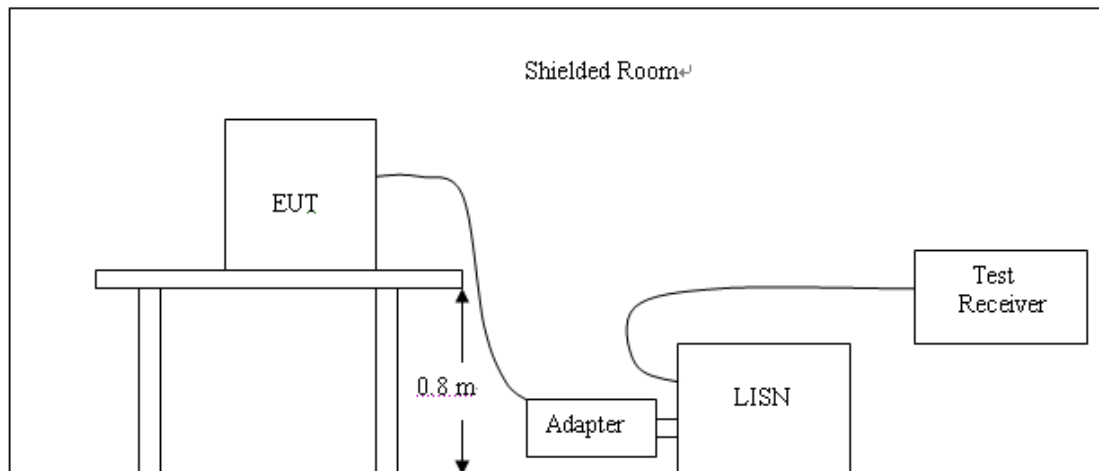
Radiated Emission						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due. Date
1	Biconilog Antenna	ETS•Lindgren	3142D	00108096	2011/01/29	2012/01/29
2	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESI 26	100009	2011/04/15	2012/04/14
3	HORN ANTENNA	ROHDE & SCHWARZ	HF906	100067	2011/04/15	2012/04/14



## 4 TEST CONDITIONS AND RESULTS

### 4.1 Conducted Emissions Test (N/A)

#### TEST CONFIGURATION



#### TEST PROCEDURE

- 1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4.
- 2 Support equipment, if needed, was placed as per ANSI C63.4.
- 3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- 4 If a EUT received DC power from the adapter, the adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5 All support equipments received AC power from a second LISN, if any.
- 6 The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
- 8 During the above scans, the emissions were maximized by cable manipulation.

**Conducted Power Line Emission Limit**

For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following :

Frequency (MHz)	Maximum RF Line Voltage (dBµV)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

\* Decreasing linearly with the logarithm of the frequency

For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

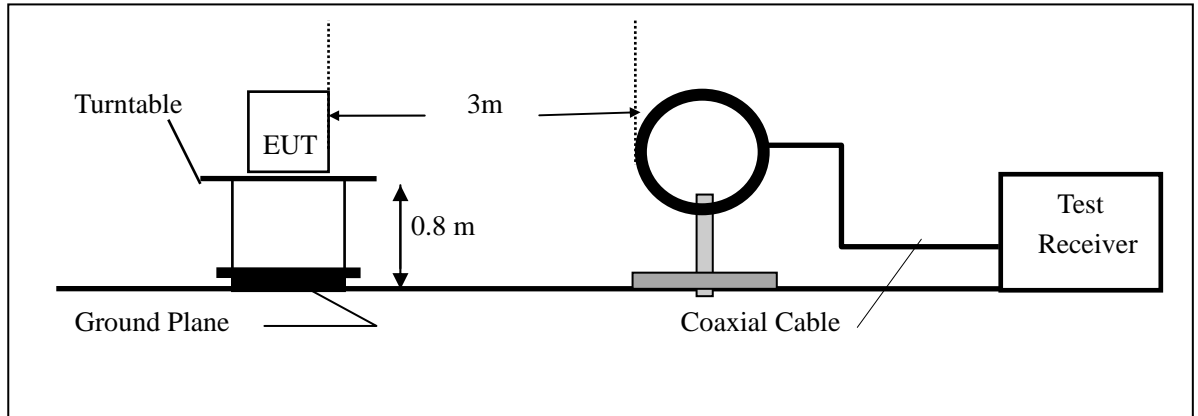
**TEST RESULTS**

N/A

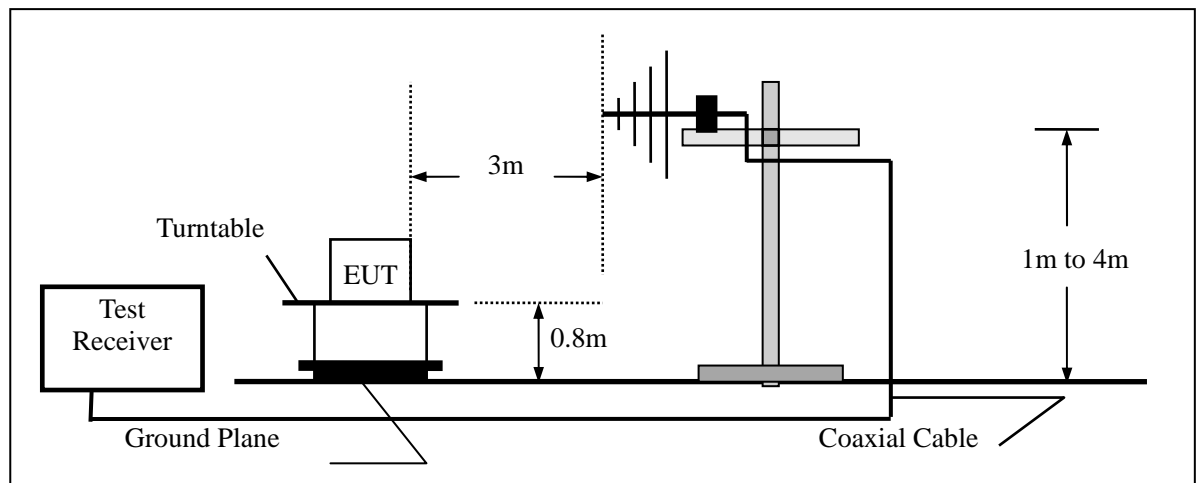
## 4.2 Radiated Emission Test

### TEST CONFIGURATION

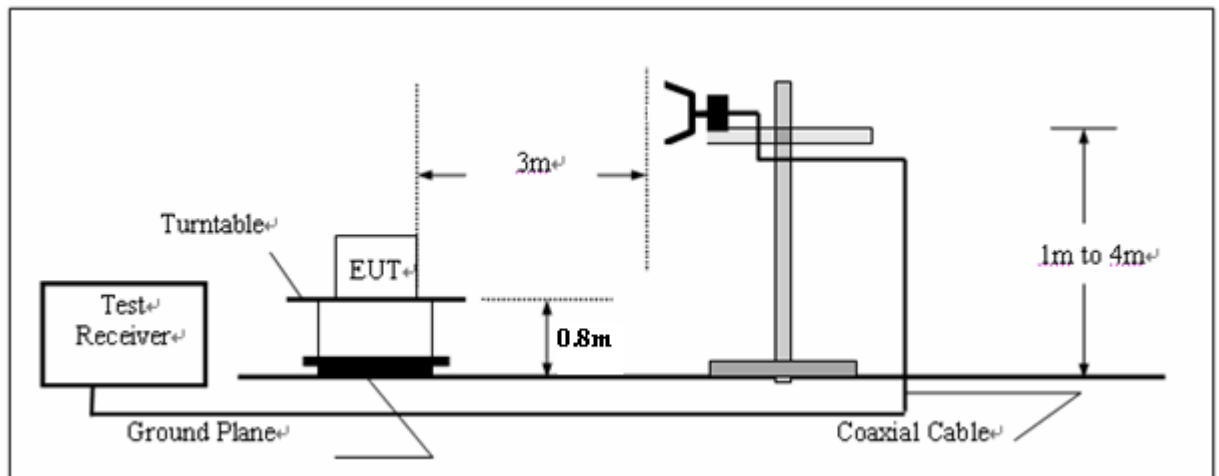
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



### **Field Strength Calculation**

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

### **Radiation Limit**

For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Distance (Meters)	Radiated (dBµV/m)	Radiated (µV/m)
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

### **Test Procedure**

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.

Note:

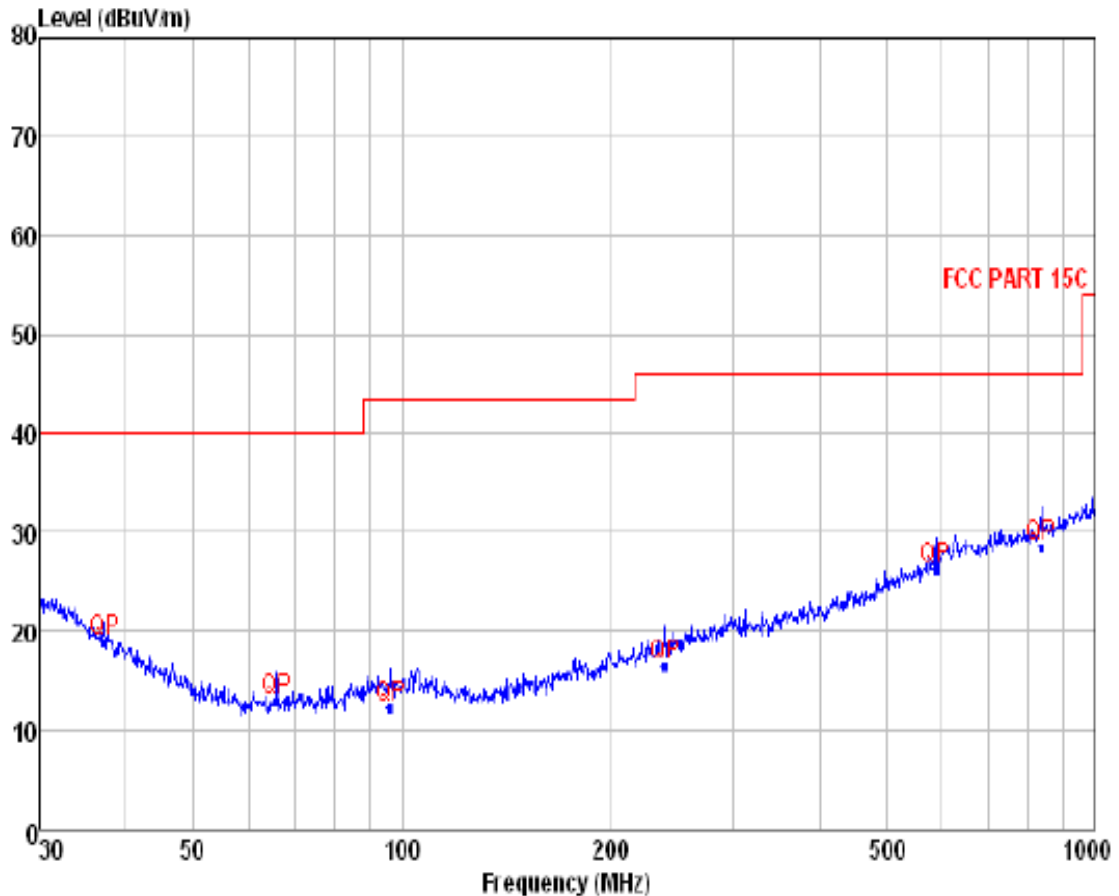
Three axes are chosen for pretest, the Z axis is the worst mode for final test.

For battery operated equipment, the equipment tests shall be performed using a new battery.

**TEST RESULTS**

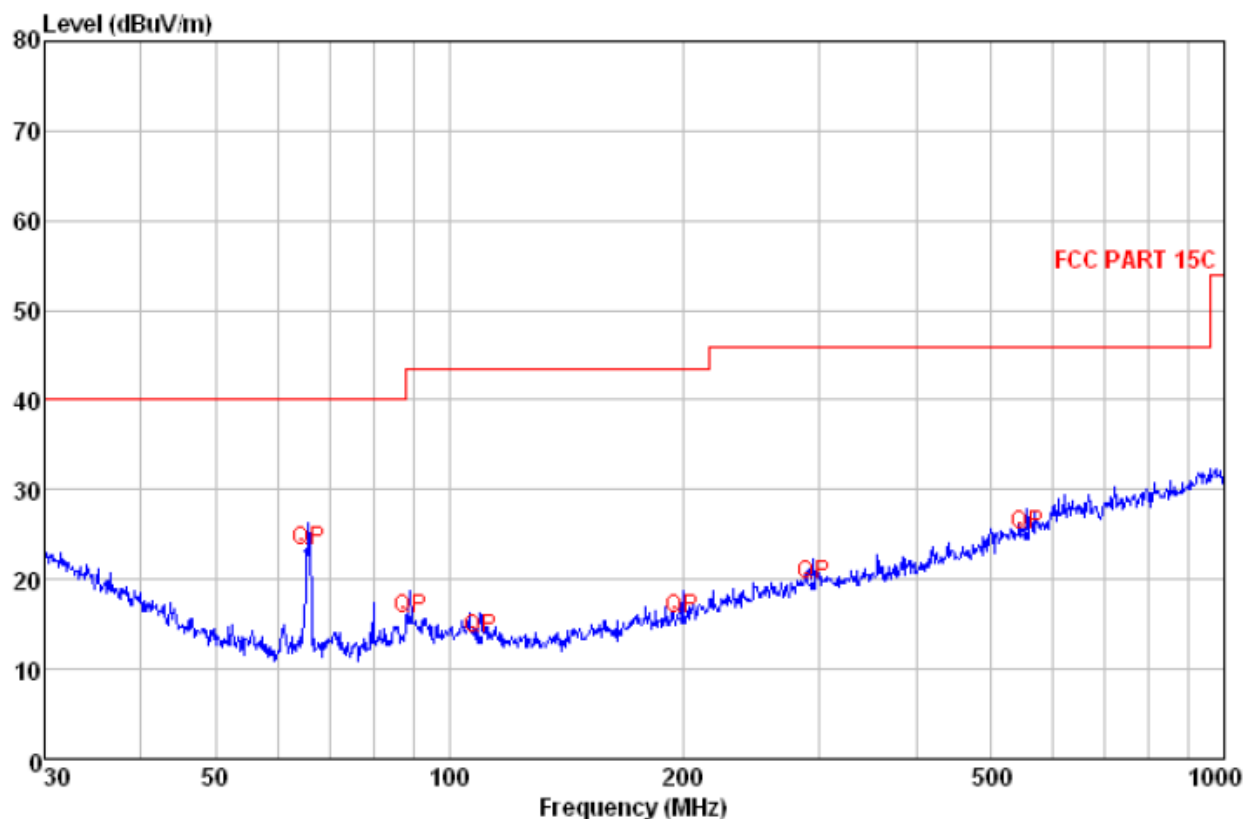
Below 1GHz Test Results:

Horizontal:



No.	Freq MHz	Level dBUV/m	Remark	Antenna Factor dB/m	Cable Loss dB	Limit Line dBUV/m	Margin dB	A/pos cn	I/pos deg
1	37.155	18.84	QP	13.82	1.70	40.00	-21.16	200	163
2	65.803	12.92	QP	6.62	1.96	40.00	-27.08	150	151
3	96.099	12.16	QP	8.54	2.13	43.50	-31.34	200	177
4	239.987	16.52	QP	11.84	2.55	46.00	-29.48	200	155
5	588.906	26.34	QP	19.63	2.96	46.00	-19.66	100	169
6	836.244	28.49	QP	22.30	3.12	46.00	-17.51	200	142

Vertical:



No.	Freq MHz	Level dBuV/m	Remark	Antenna Factor dB/m	Cable Loss dB	Limit Line dBuV/m	Margin dB	A/pos cm	T/pos deg
1	65.803	23.26	QP	6.62	1.96	40.00	-16.74	100	264
2	88.964	15.64	QP	8.20	2.10	43.50	-27.86	100	251
3	109.412	13.34	QP	8.42	2.19	43.50	-30.16	200	274
4	199.986	15.66	QP	10.10	2.47	43.50	-27.84	100	259
5	295.147	19.37	QP	13.96	2.64	46.00	-26.63	150	241
6	556.774	24.97	QP	19.01	2.93	46.00	-21.03	100	243

Remark:

- (1) Measuring frequencies from 30 MHz to the 1 GHz.
- (2) \* denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (3) The IF bandwidth of EMI Test Receiver was 120KHz for measuring from 30 MHz to 1 GHz and 1 MHz for measuring above 1 GHz

**Above 1 GHz Test Results:**

## Top Channel

Freq. (MHz)	Ant.Pol. H/V	DetectorMode (PK/AV)	Reading (dBuV)	Ant./CL/ Amp. CF(dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)	Note
2474.5	V	Peak	89.14	0.97	90.11	114.00	-23.89	F
2474.5	H	Peak	88.84	0.97	89.81	114.00	-24.19	F
4949.0	V	Peak	42.93	9.68	52.61	73.98	-21.37	H
4949.0	H	Peak	37.45	9.68	47.13	73.98	-26.85	H
7423.5	V		---					H
7423.5	H		---					H
Others			---					

## Middle Channel:

Freq. (MHz)	Ant.Pol. H/V	DetectorMode (PK/AV)	Reading (dBuV)	Ant./CL/ Amp. CF(dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)	Note
2445.8	V	Peak	88.91	0.81	89.72	114.00	-24.28	F
2445.8	H	Peak	88.79	0.81	89.60	114.00	-24.40	F
4891.6	V	Peak	42.67	8.69	51.36	73.98	-22.62	H
4891.6	H	Peak	39.55	8.69	48.24	73.98	-25.74	H
7337.4	V		---					H
7337.4	H		---					H
Others			---					

## Bottom Channel:

Freq. (MHz)	Ant.Pol. H/V	DetectorMode (PK/AV)	Reading (dBuV)	Ant./CL/ Amp. CF(dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)	Note
2404.8	V	Peak	91.98	0.60	92.58	114.00	-21.42	F
2404.8	H	Peak	91.08	0.60	91.68	114.00	-22.32	F
4809.6	V	Peak	43.86	7.82	51.68	73.98	-22.30	H
4809.6	H	Peak	41.46	7.82	49.28	73.98	-24.70	H
7214.4	V		---					H
7214.4	H		---					H
Others			---					

*Remark:*

- (1) Measuring frequencies from 1 GHz to the 18 GHz.
- (2) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) \* denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.

- 
- (4) *Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
  - (5) *The IF bandwidth of EMI Test Receiver was 120KHz for measuring from 30 MHz to 1 GHz and 1 MHz for measuring above 1 GHz*
  - (6) *No emission above 10GHz, so no test result is reported for above 10GHz*



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## 4.3 Band Edge Measurement

### TEST CONFIGURATION

Same as Section 4.2

### TEST PROCEDURE

The band edge compliance of RF radiated emission should be measured by following the guidance in ANSI C63.4 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW to 100KHz and VBM to 300KHz to measure the peak field strength and set RBW to 1MHz and VBW to 10Hz to measure the average radiated field strength.

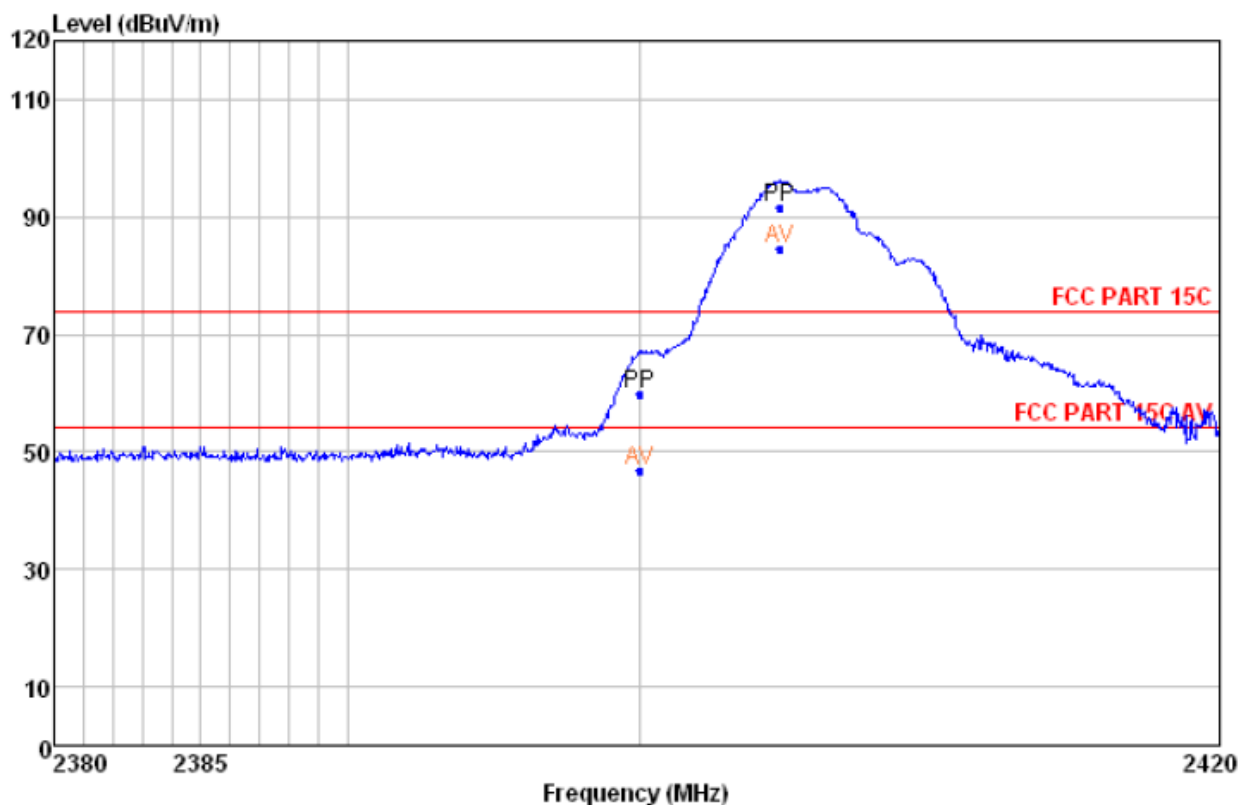
The conducted RF band edge was measured by using a spectrum analyzer. Set span wide enough to capture the highest in-band emission and the emission at the band edge. Set RBW to 100 KHz and VBM to 300 KHz, to measure the conducted peak band edge.

### LIMIT

FCC PART 15.249(d) 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.

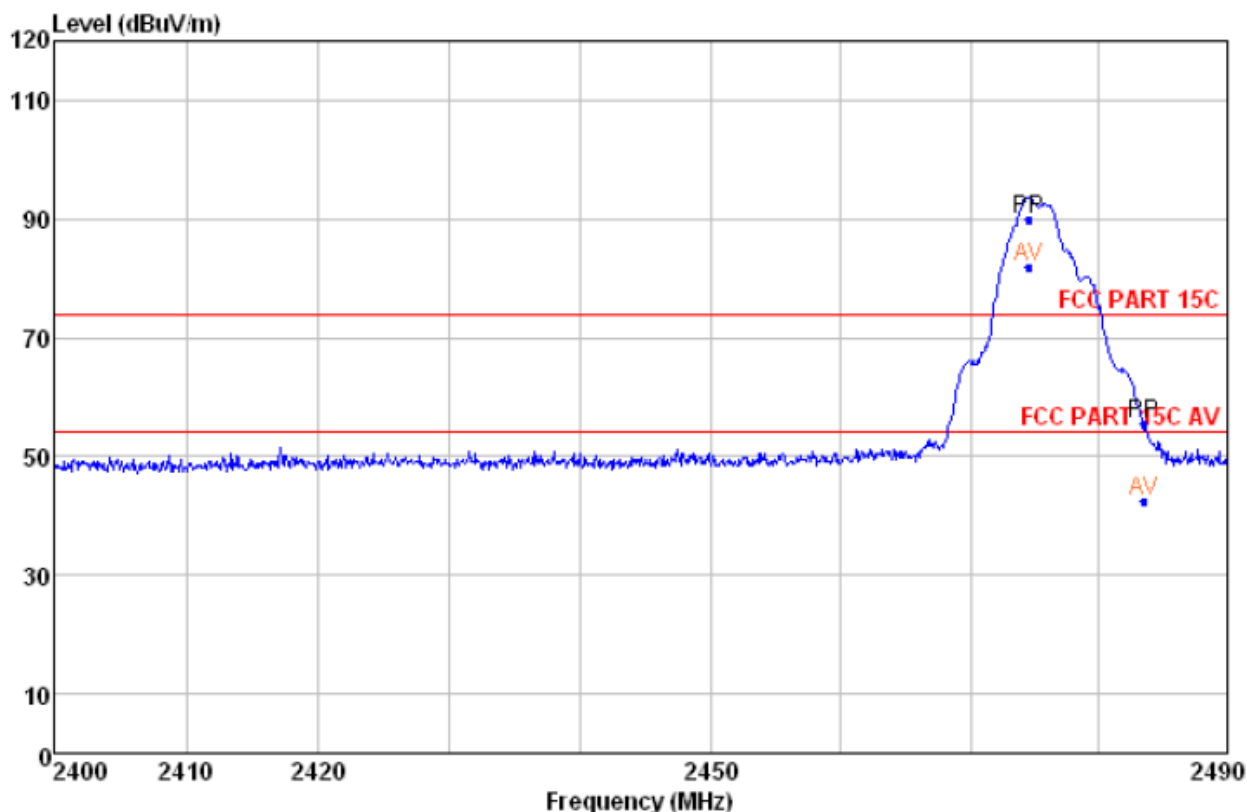
**TEST RESULTS**

Band-Edge Compliance: Restricted Band, Low Channel,



No.	Freq MHz	Level dBuV/m	Remark	Antenna Factor dB/m	Cable Loss dB	Limit Line dBuV/m	Margin dB	A/pos cm	T/pos deg
1	2400.000	59.94	Peak	32.02	4.22	74.00	-14.06	351	307
2	2400.000	46.84	Average	32.02	4.22	54.00	-7.16	351	307
3	2404.842	91.68	Peak	32.06	4.22	74.00	17.68	351	307
4	2404.842	84.68	Average	32.06	4.22	54.00	30.68	351	307

Band-Edge: Restricted Band, High Channel



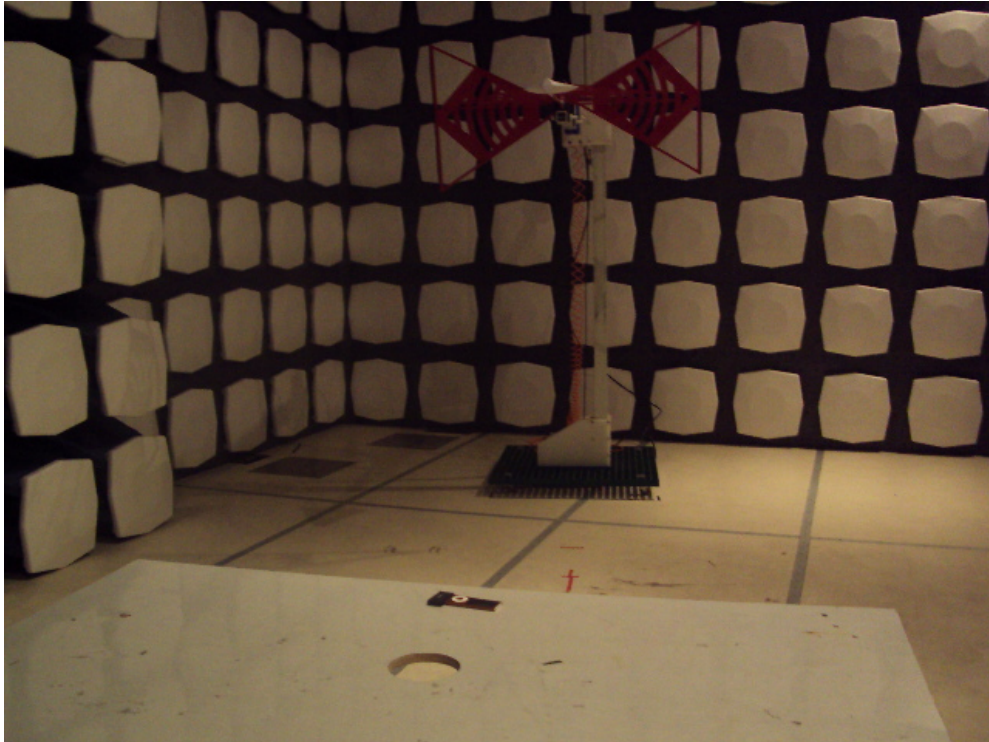
No.	Freq MHz	Level dBuV/m	Remark	Antenna Factor dB/m	Cable Loss dB	Limit Line dBuV/m	Margin dB	A/pos cm	T/pos deg
1	2474.465	89.81	Peak	32.53	4.28	74.00	15.81	351	271
2	2474.465	81.81	Average	32.53	4.28	54.00	27.81	351	271
3	2483.500	55.48	Peak	32.59	4.29	74.00	-18.52	351	271
4	2483.500	42.48	Average	32.59	4.29	54.00	-11.52	351	271

Note:

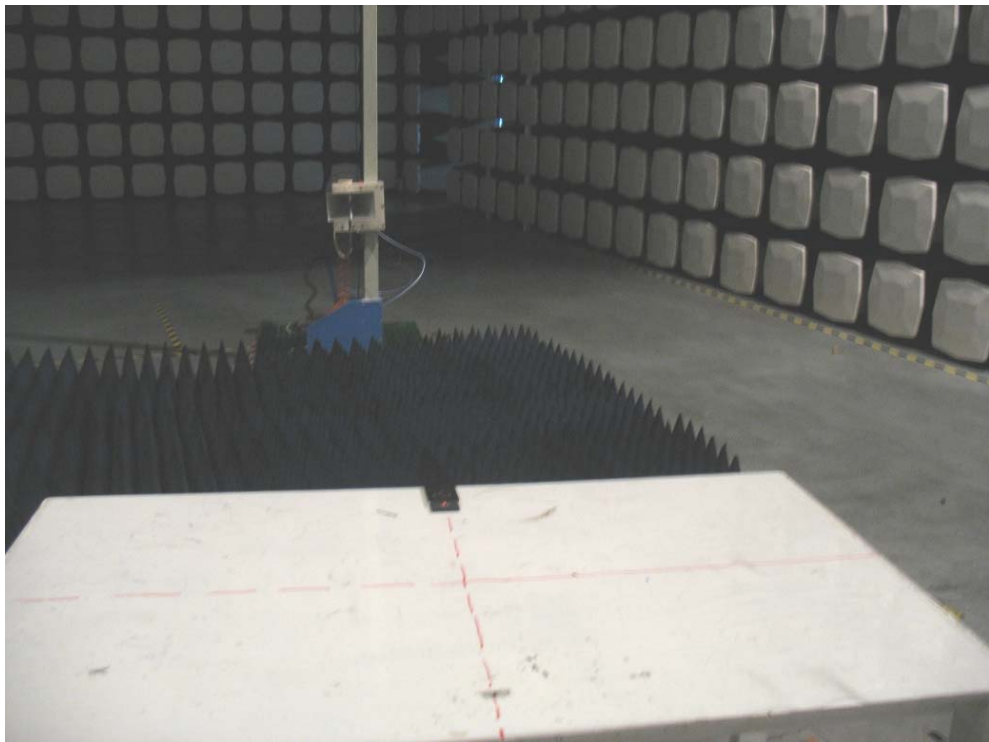
1. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209.
2. The average measurement was not performed when the peak measured data under the limit of average detection.

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## 5 Test Setup Photos of the EUT



(Radiated emission below 1GHz)

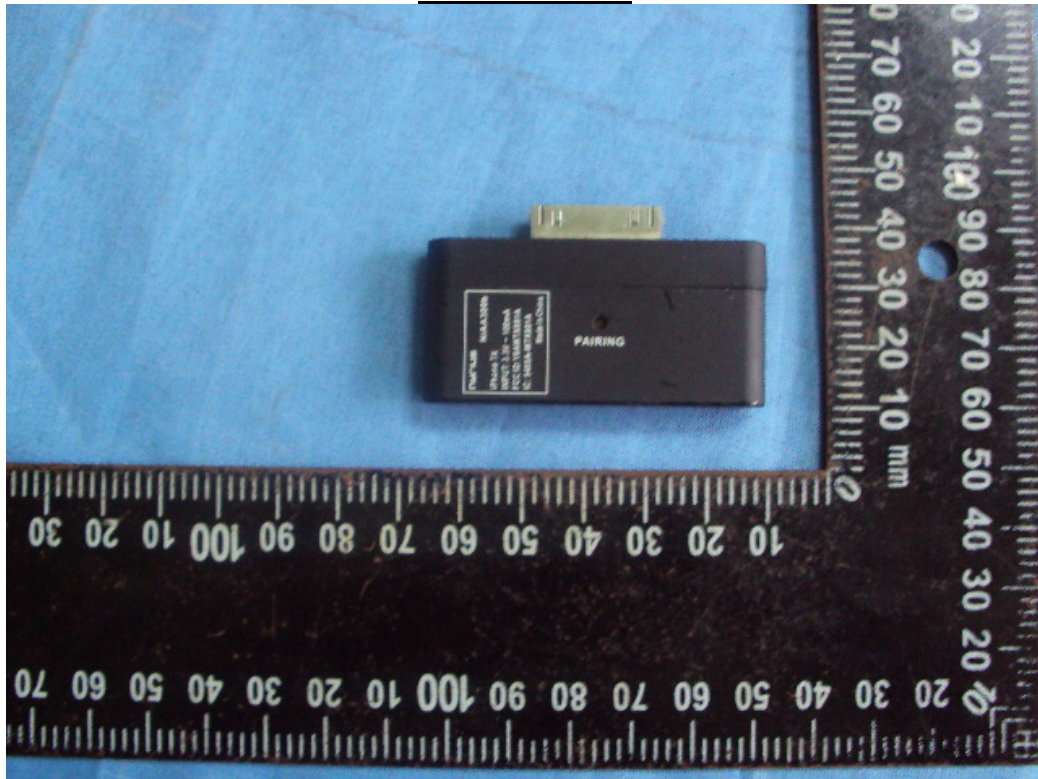


(Radiated emission above 1GHz)

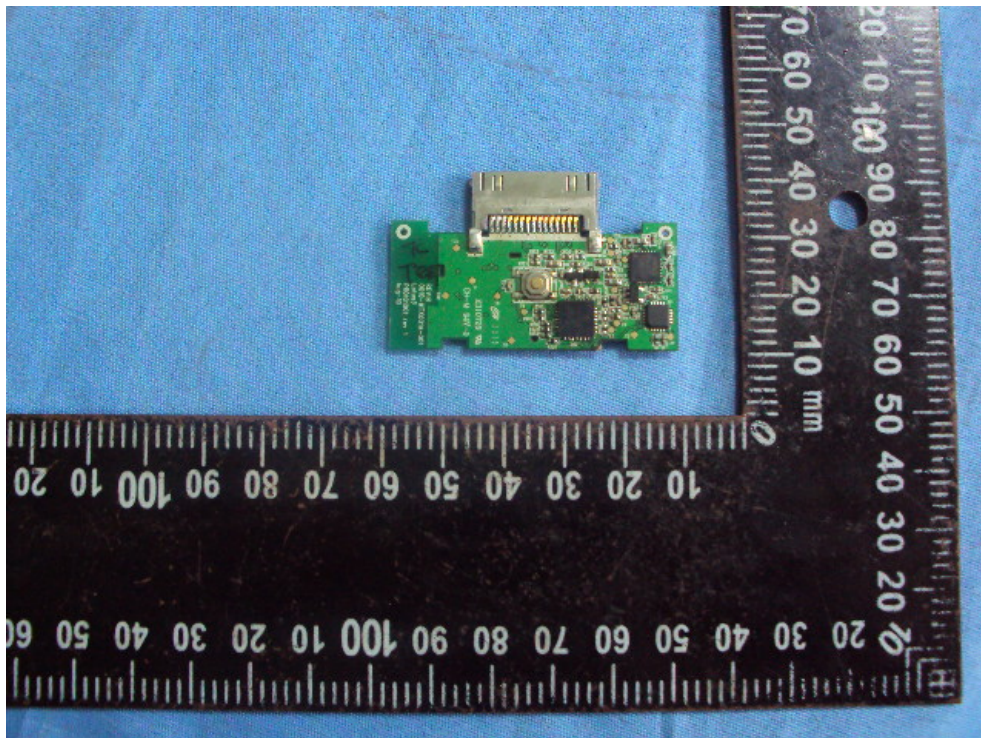
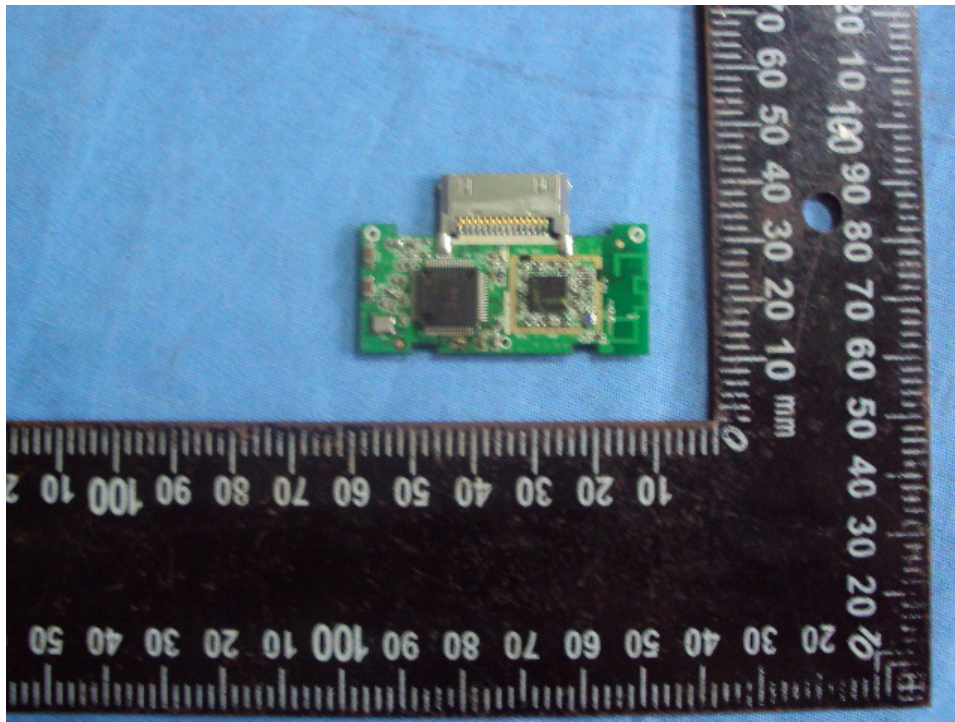


## 6 External and Internal Photos of the EUT

### External Photos





**Internal Photos**

.....**End of Report**.....