

FCC TEST REPORT
for
Hunan Ocean Wing E-commerce Technology Co., Ltd.

Bluetooth Keyboard
Model No.: 98ANSLM78-02BTA

Prepared for : Hunan Ocean Wing E-commerce Technology Co., Ltd.
Address : 25 Floor, Jiatian International Building, #359 Furong Zhonglu,
Changsha, Hunan Province, China

Prepared By : Shenzhen Anbotek Compliance Laboratory Limited
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Report Number : 201307874F
Date of Test : Jul. 23~ Aug. 12, 2013
Date of Report : Aug. 12, 2013

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APPENDIX I (External Photos) (3 Pages)
APPENDIX II (Internal Photos) (3 Pages)

TEST REPORT

Applicant : Hunan Ocean Wing E-commerce Technology Co., Ltd.
Manufacturer : Hunan Ocean Wing E-commerce Technology Co., Ltd.
EUT : Bluetooth Keyboard
Model No. : 98ANSLM78-02BTA
Serial No. : N/A
Trade Mark : ANKER
Rating : DC 3.7V, 180mAH

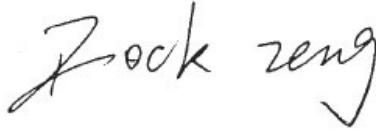
Measurement Procedure Used:

FCC Part15 Subpart C, Paragraph 15.207, 15.249 & 15.209

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC Part 15 Subpart C requirements.

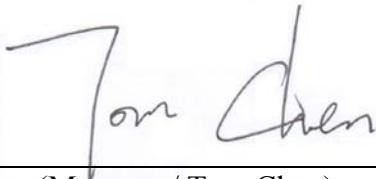
This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of Test : _____
Jul. 23~ Aug. 12, 2013

Prepared by : _____

(Tested Engineer / Rock Zeng)

Reviewer : _____

(Project Manager / Sally Zhang)

Approved & Authorized Signer : _____

(Manager / Tom Chen)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT : Bluetooth Keyboard

Model Number : 98ANSLM78-02BTA

Test Power Supply : DC 3.7V

Frequency : 2402~2480MHz

Antenna Specification : Printed Antenna:0 dBi

Applicant Address : Hunan Ocean Wing E-commerce Technology Co., Ltd.
: 25 Floor, Jiatian International Building, #359 Furong Zhonglu,
Changsha, Hunan Province, China

Manufacturer Address : Hunan Ocean Wing E-commerce Technology Co., Ltd.
: 25 Floor, Jiatian International Building, #359 Furong Zhonglu,
Changsha, Hunan Province, China

Date of receiver : Jul. 23, 2013

Date of Test : Jul. 23~ Aug. 12, 2013

1.2. Auxiliary Equipment Used during Test

Adapter

: Manufacturer: FUHONG

M/N: CW0502000

Input: 100-240V~, 50-60Hz, 0.4A Max

Output: 5V---, 2A

CE , FCC: DOC

1.3. Description of Test Facility

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

CNAS - LAB Code: L3503

Shenzhen Anbotek Compliance Laboratory Limited., Laboratory has been assessed and in compliance with CNAS/CL01: 2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

FCC-Registration No.: 752021

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 752021, July 10, 2013.

IC-Registration No.: 8058A-1

Shenzhen Anbotek Compliance Laboratory Limited., EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration 8058A-1, February 22, 2013.

Test Location

All Emissions tests were performed at

Shenzhen Anbotek Compliance Laboratory Limited. at 1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road, Nanshan District, Shenzhen, Guangdong, China

1.4. Measurement Uncertainty

Radiation Uncertainty : Ur = 4.3dB

Conduction Uncertainty : Uc = 3.4dB

2. Test Procedure

GENERAL: This report shall NOT be reproduced except in full without the written approval of Shenzhen Anbotek Compliance Laboratory Limited. The EUT was transmitting a test signal during the testing.

RADIATION INTERFERENCE: The test procedure used was ANSI STANDARD C63.4-2009 using a spectrum analyzer with a pre-selector. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was 100KHz and the video bandwidth was 300KHz up to 1.0GHz and 1.0MHz with a video BW of 3.0MHz above 1.0GHz. The ambient temperature of the EUT was 74.3oF with a humidity of 69%.

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB. The gain of the Preselector was accounted for in the Spectrum Analyzer Meter Reading.

Example:

Freq (MHz) METER READING + ACF = FS
20 dBuV + 10.36 dB = 30.36 dBuV/m @ 3m

ANSI STANDARD C63.4-2009 10.1.7 MEASUREMENT PROCEDURES: The EUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The EUT was placed in the center of the table (1.5m side). The table used for radiated measurements is capable of continuous rotation. When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

3. Conducted Limits

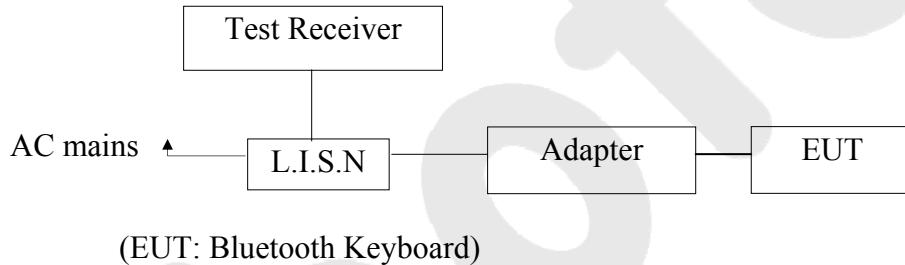
Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Two-Line V-network	Rohde & Schwarz	ENV216	10055	Apr. 23, 2013	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Apr. 23, 2013	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Apr. 23, 2013	1 Year

Conduction Uncertainty : $U_c = 3.4\text{dB}$

3.1. Block Diagram of Test Setup

3.1.1. Block diagram of connection between the EUT and simulators



3.2. Power Line Conducted Emission Measurement Limits (15.207)

Frequency MHz	Limits dB(μV)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66 ~ 56*	56 ~ 46*
0.50 ~ 5.00	56	46
5.00 ~ 30.00	60	50

Notes: 1. *Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

3.3. Configuration of EUT on Measurement

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

EUT : Bluetooth Keyboard
 Model Number : 98ANSLM78-02BTA
 Applicant : Hunan Ocean Wing E-commerce Technology Co., Ltd.

3.4. Operating Condition of EUT

- 3.4.1. Setup the EUT and simulator as shown as Section 3.1.
- 3.4.2. Turn on the power of all equipment.
- 3.4.3. Let the EUT work in test mode (Charging Via Adapter) and measure it.

3.5. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.4-2003 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9KHz.

The frequency range from 150KHz to 30MHz is checked.

The test results are reported on Section 3.6.

3.6. Power Line Conducted Emission Measurement Results

PASS.

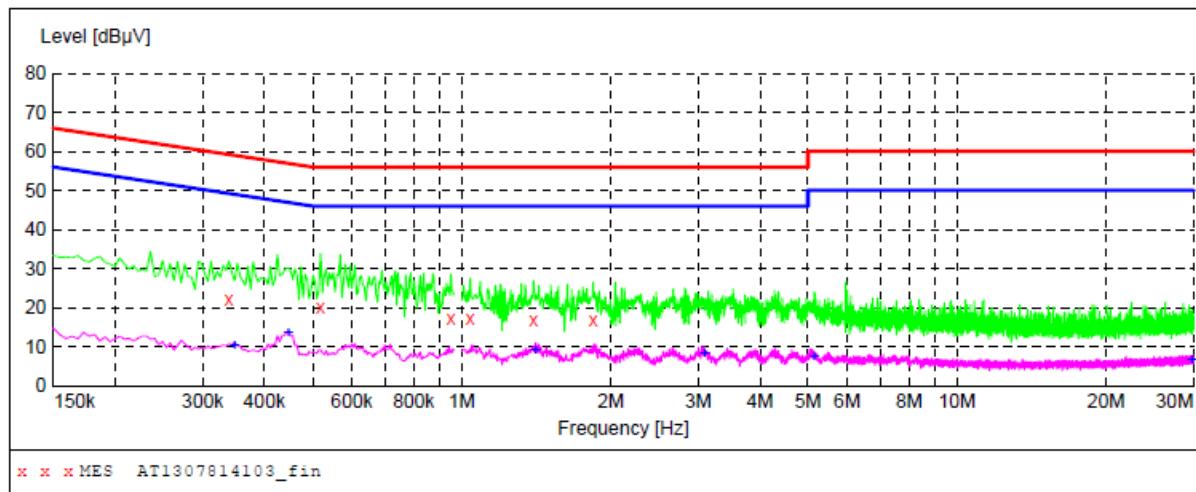
The frequency range from 150KHz to 30 MHz is investigated.

Please refer the following pages.

CONDUCTED EMISSION TEST DATA

EUT: Bluetooth Keyboard M/N: 98ANSLM78-02BTA
 Operating Condition: Charging
 Test Site: 1# Shielded Room
 Operator: Finley Li
 Test Specification: AC 120V/60Hz for Adapter
 Comment: Live Line
 Tem:25°C Hum:50%

SCAN TABLE: "Voltage (150K~30M) FIN"
 Short Description: 150K-30M Disturbance Voltages



MEASUREMENT RESULT: "AT1307814103_fin"

7/24/2013 3:40PM	Frequency	Level	Transd	Limit	Margin	Detector	Line	PE
	MHz	dB μ V	dB	dB μ V	dB			
	0.339000	22.10	20.1	59	37.1	QP	L1	GND
	0.519000	19.90	20.1	56	36.1	QP	L1	GND
	0.951000	17.30	20.2	56	38.7	QP	L1	GND
	1.040500	17.10	20.2	56	38.9	QP	L1	GND
	1.396000	16.80	20.2	56	39.2	QP	L1	GND
	1.841500	16.70	20.3	56	39.3	QP	L1	GND

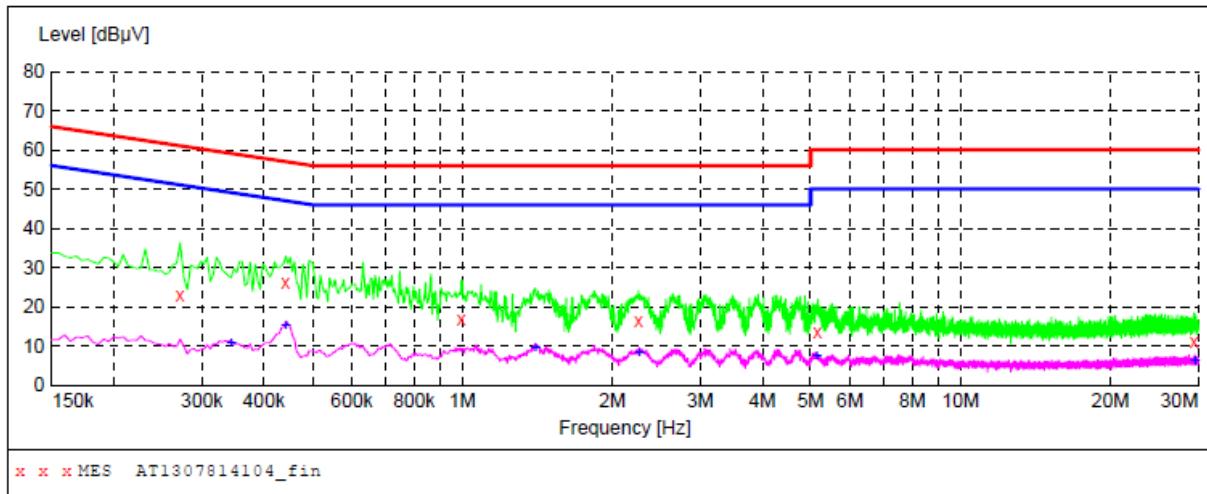
MEASUREMENT RESULT: "AT1307814103_fin2"

7/24/2013 3:40PM	Frequency	Level	Transd	Limit	Margin	Detector	Line	PE
	MHz	dB μ V	dB	dB μ V	dB			
	0.348000	10.20	20.1	49	38.8	AV	L1	GND
	0.447000	13.70	20.1	47	33.2	AV	L1	GND
	1.409500	9.10	20.2	46	36.9	AV	L1	GND
	3.083500	8.20	20.4	46	37.8	AV	L1	GND
	5.140000	7.60	20.5	50	42.4	AV	L1	GND
	29.710000	6.50	20.9	50	43.5	AV	L1	GND

CONDUCTED EMISSION TEST DATA

EUT: Bluetooth Keyboard M/N: 98ANSLM78-02BTA
 Operating Condition: Charging
 Test Site: 1# Shielded Room
 Operator: Finley Li
 Test Specification: AC 120V/60Hz for Adapter
 Comment: Neutral Line
 Tem:25°C Hum:50%

SCAN TABLE: "Voltage (150K~30M) FIN"
 Short Description: 150K-30M Disturbance Voltages



MEASUREMENT RESULT: "AT1307814104_fin"

7/24/2013 3:43PM

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.271500	22.80	20.1	61	38.3	QP	N	GND
0.442500	26.10	20.1	57	30.9	QP	N	GND
0.996000	16.80	20.2	56	39.2	QP	N	GND
2.255500	16.50	20.3	56	39.5	QP	N	GND
5.171500	13.50	20.5	60	46.5	QP	N	GND
29.413000	11.10	20.9	60	48.9	QP	N	GND

MEASUREMENT RESULT: "AT1307814104_fin2"

7/24/2013 3:43PM

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.343500	10.70	20.1	49	38.4	AV	N	GND
0.442500	15.40	20.1	47	31.6	AV	N	GND
1.400500	9.30	20.2	46	36.7	AV	N	GND
2.264500	8.40	20.3	46	37.6	AV	N	GND
5.135500	7.40	20.5	50	42.6	AV	N	GND
29.525500	6.30	20.9	50	43.7	AV	N	GND

4. Radiation Interference

4.1. Requirements (15.249, 15.209):

FIELD STRENGTH of Fundamental: 902-928 MHZ 2.4-2.4835 GHz 94 dB μ V/m @3m	FIELD STRENGTH of Harmonics 54 dB μ V/m @3m	S15.209 30 - 88 MHz 88 - 216 MHz 216 - 960 MHz ABOVE 960 MHz	40 dB μ V/m @3M 43.5 46 54dB μ V/m
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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.

4.2 Test Procedure

The EUT is placed on a turn table which is 0.8 meter high above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.

All readings from 30MHz to 1GHz are quasi-peak values with a resolution bandwidth of 120kHz. All reading are above 1GHz, peak & average values with a resolution bandwidth of 1MHz. The EUT is tested in 9*6*6 Chamber.

The test results are listed in Section 4.3.

Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde & Schwarz	ESCI	101604	Apr. 23, 2013	1 Year
2.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Apr. 23, 2013	1 Year
3.	Pre-amplifier	SONOMA	310N	186860	Apr. 23, 2013	1 Year
4.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A

Radiation Uncertainty : Ur = 4.3dB

4.3 Test Results

PASS.

Please refer the following pages.

Data:

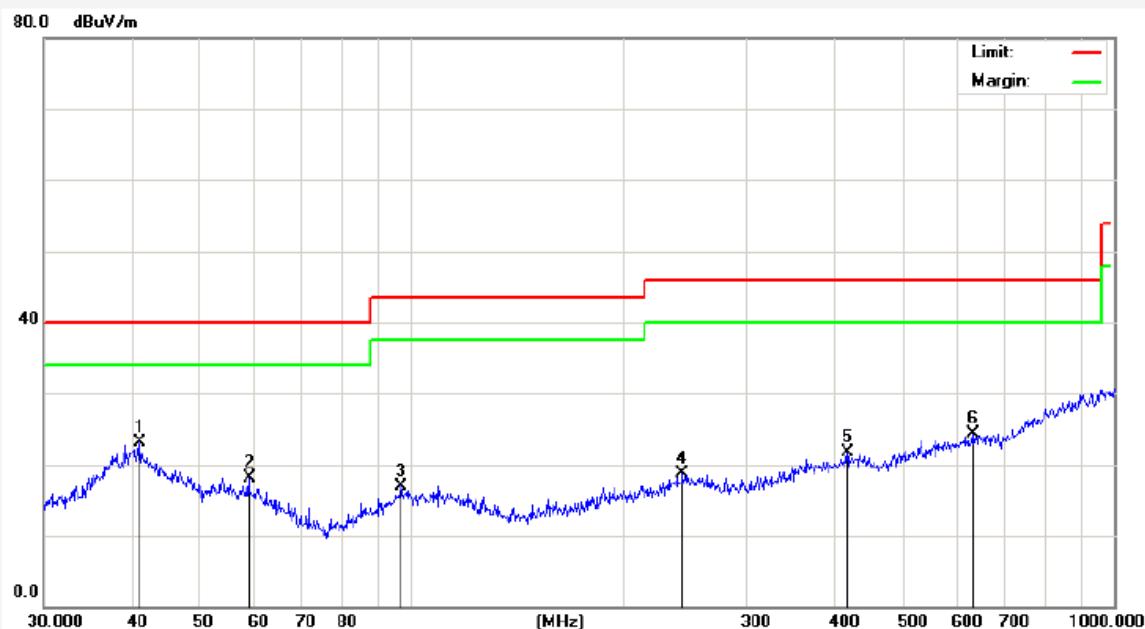
Below 1GHz:

Job No.:	AT1307814F	Polarization:	Horizontal
Standard:	(RE)FCC PART15 C _3m	Power Source:	DC 3.7V
Test item:	Radiation Test	Date:	2013/07/24
Temp.(C)/Hum.(%RH):	24.3(C)/55%RH	Time:	09/36/15
EUT:	Bluetooth Keyboard	Test By:	Rock Zeng
Model:	98ANSLM78-02BTA	Distance:	3m
Mode:	BT Mode		
Note:	30-1000MHz		



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	42.0066	32.16	-11.15	21.01	40.00	-18.99	peak			
2	53.8818	32.90	-14.85	18.05	40.00	-21.95	peak			
3	103.8055	32.93	-20.71	12.22	43.50	-31.28	peak			
4	324.4561	37.02	-15.04	21.98	46.00	-24.02	peak			
5	359.1860	36.21	-13.70	22.51	46.00	-23.49	peak			
6	419.1081	37.99	-12.40	25.59	46.00	-20.41	peak			

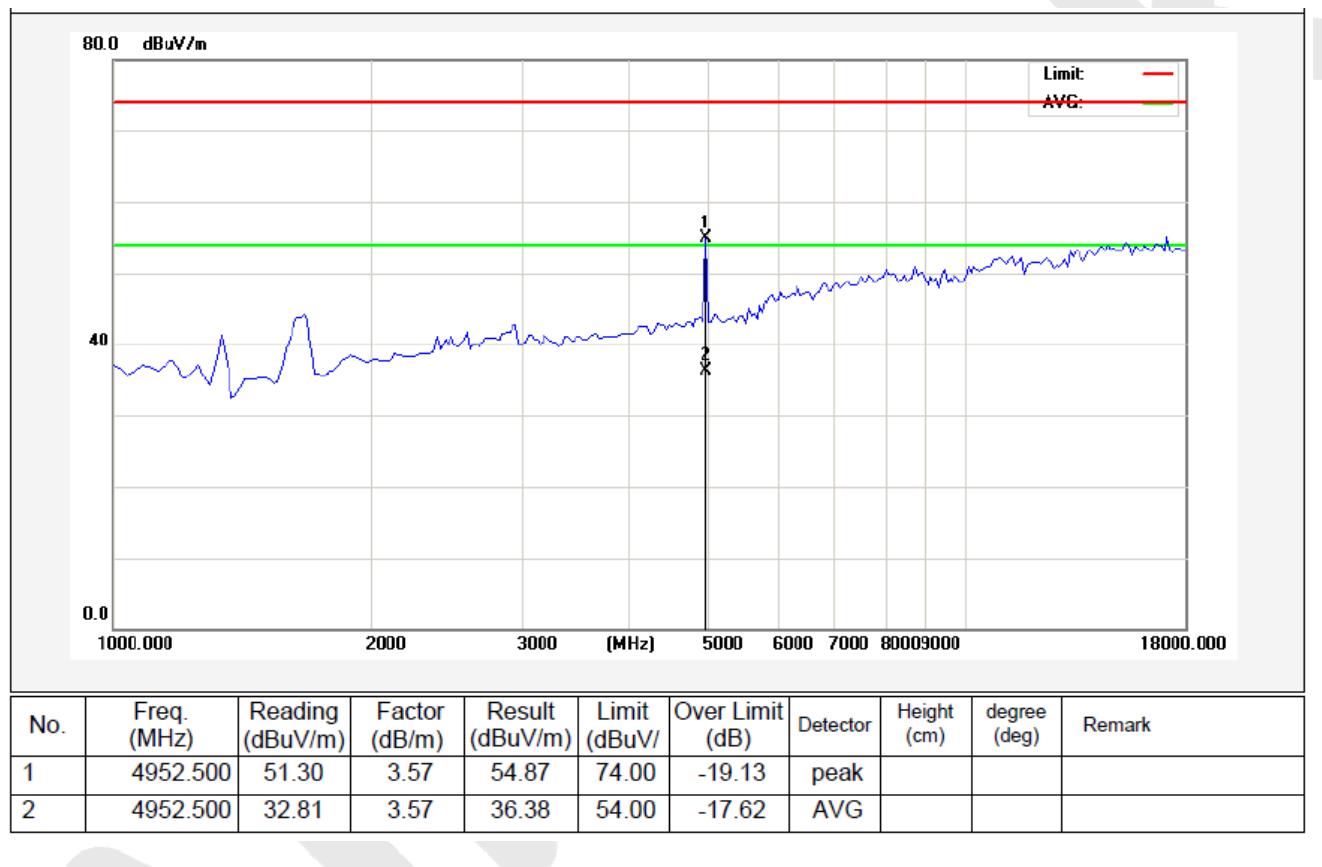
Job No.:	AT1307814F	Polarization:	Vertical
Standard:	(RE)FCC PART15 C _3m	Power Source:	DC 3.7V
Test item:	Radiation Test	Date:	2013/07/24
Temp.(C)/Hum.(%RH):	24.3(C)/55%RH	Time:	09/39/55
EUT:	Bluetooth Keyboard	Test By:	Rock Zeng
Model:	98ANSLM78-02BTA	Distance:	3m
Mode:	BT Mode		
Note:	30-1000MHz		



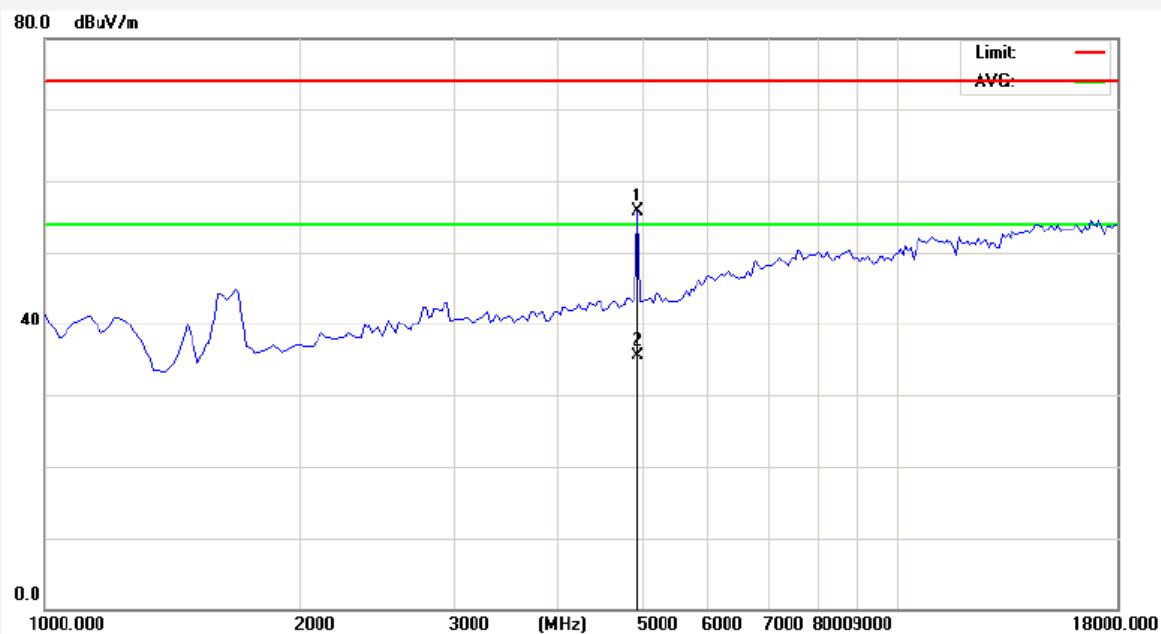
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	41.1319	33.88	-10.81	23.07	40.00	-16.93	peak			
2	58.8185	33.35	-15.28	18.07	40.00	-21.93	peak			
3	96.7749	32.93	-15.93	17.00	43.50	-26.50	peak			
4	243.3771	32.68	-14.07	18.61	46.00	-27.39	peak			
5	417.6409	33.13	-11.35	21.78	46.00	-24.22	peak			
6	629.4772	33.34	-9.01	24.33	46.00	-21.67	peak			

Above 1 GHz:

Job No.:	AT1307814F	Polarization:	Horizontal
Standard:	(RE)FCC PART15 C _3m	Power Source:	DC 3.7V
Test item:	Radiation Test	Date:	2013/07/31
Temp.(C)/Hum.(%RH):	24.3(C)/55%RH	Time:	13/05/19
EUT:	Bluetooth Keyboard	Test By:	Rock Zeng
Model:	98ANSLM78-02BTA	Distance:	3m
Mode:	BT Mode		
Note:	2402MHz		

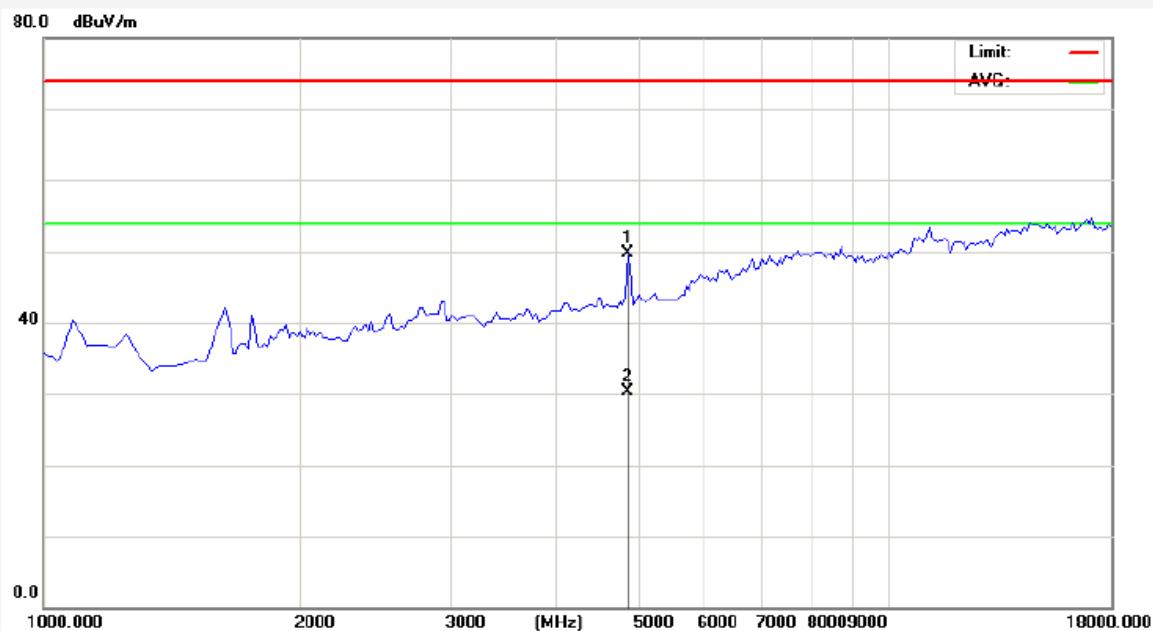


Job No.:	AT1307814F	Polarization:	Vertical
Standard:	(RE)FCC PART15 C _3m	Power Source:	DC 3.7V
Test item:	Radiation Test	Date:	2013/07/31
Temp.(C)/Hum.(%RH):	24.3(C)/55%RH	Time:	13/09/33
EUT:	Bluetooth Keyboard	Test By:	Rock Zeng
Model:	98ANSLM78-02BTA	Distance:	3m
Mode:	BT Mode		
Note:	2402MHz		



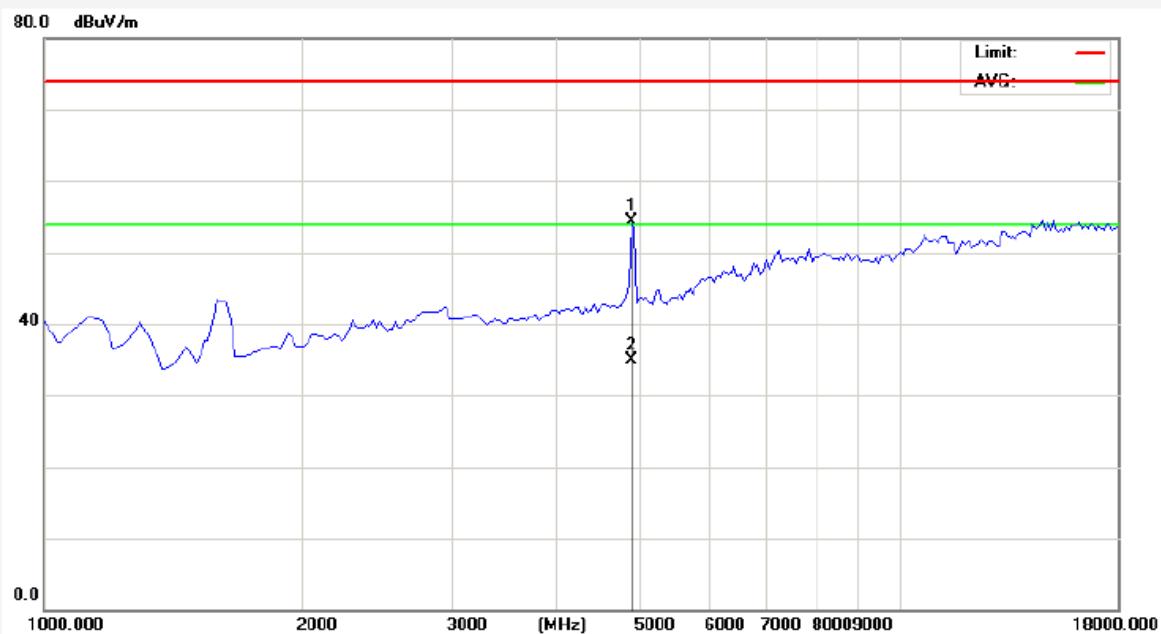
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	4952.500	52.06	3.57	55.63	74.00	-18.37	peak			
2	4952.500	31.95	3.57	35.52	54.00	-18.48	AVG			

Job No.:	AT1307814F	Polarization:	Horizontal
Standard:	(RE)FCC PART15 C _3m	Power Source:	DC 3.7V
Test item:	Radiation Test	Date:	2013/07/31
Temp.(C)/Hum.(%RH):	24.3(C)/55%RH	Time:	13/12/08
EUT:	Bluetooth Keyboard	Test By:	Rock Zeng
Model:	98ANSLM78-02BTA	Distance:	3m
Mode:	BT Mode		
Note:	2441MHz		



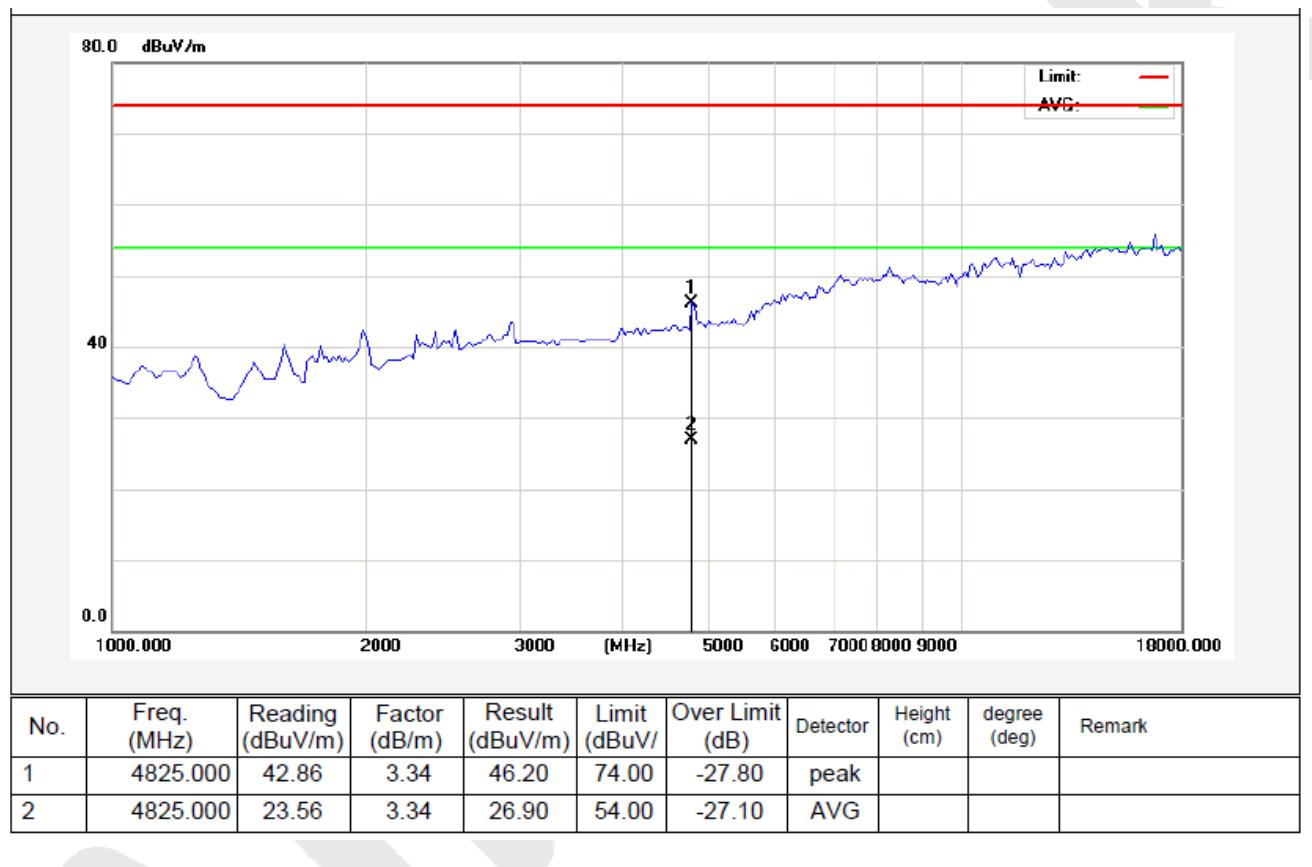
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	4867.500	46.39	3.41	49.80	74.00	-24.20	peak			
2	4867.500	26.84	3.41	30.25	54.00	-23.75	AVG			

Job No.:	AT1307814F	Polarization:	Vertical
Standard:	(RE)FCC PART15 C _3m	Power Source:	DC 3.7V
Test item:	Radiation Test	Date:	2013/07/31
Temp.(C)/Hum.(%RH):	24.3(C)/55%RH	Time:	13/15/17
EUT:	Bluetooth Keyboard	Test By:	Rock Zeng
Model:	98ANSLM78-02BTA	Distance:	3m
Mode:	BT Mode		
Note:	2441MHz		

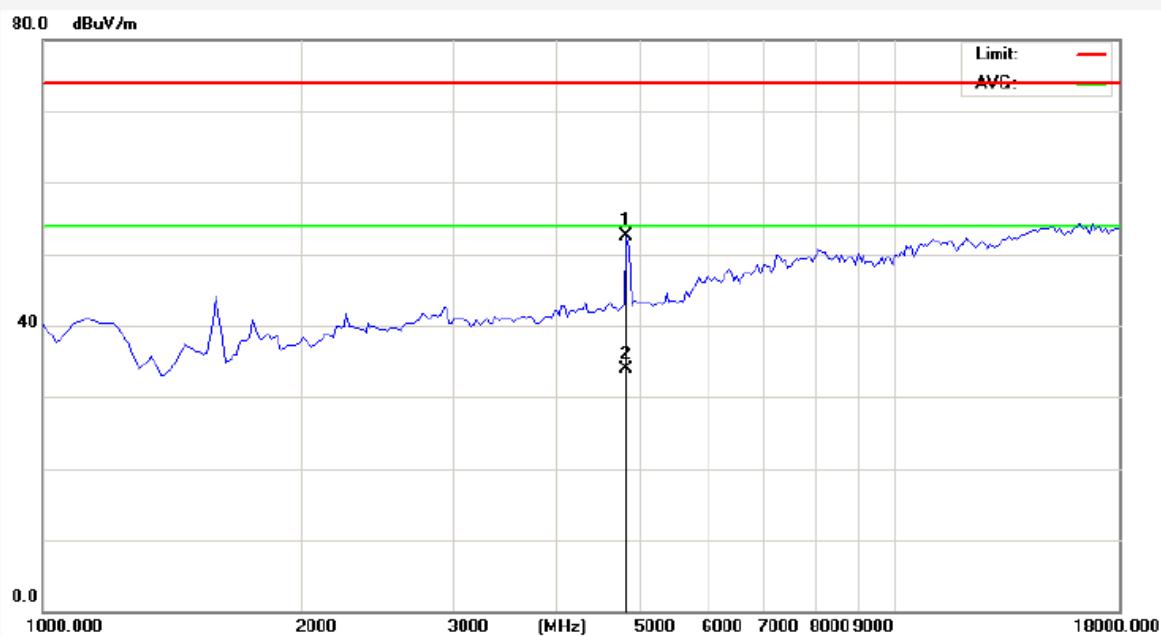


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	4867.500	50.94	3.41	54.35	74.00	-19.65	peak			
2	4867.500	31.56	3.41	34.97	54.00	-19.03	AVG			

Job No.:	AT1307814F	Polarization:	Horizontal
Standard:	(RE)FCC PART15 C _3m	Power Source:	DC 3.7V
Test item:	Radiation Test	Date:	2013/07/31
Temp.(C)/Hum.(%RH):	24.3(C)/55%RH	Time:	13/19/45
EUT:	Bluetooth Keyboard	Test By:	Rock Zeng
Model:	98ANSLM78-02BTA	Distance:	3m
Mode:	BT Mode		
Note:	2480MHz		



Job No.:	AT1307814F	Polarization:	Vertical
Standard:	(RE)FCC PART15 C _3m	Power Source:	DC 3.7V
Test item:	Radiation Test	Date:	2013/07/31
Temp.(C)/Hum.(%RH):	24.3(C)/55%RH	Time:	13/23/12
EUT:	Bluetooth Keyboard	Test By:	Rock Zeng
Model:	98ANSLM78-02BTA	Distance:	3m
Mode:	BT Mode		
Note:	2480MHz		



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	4825.000	49.26	3.34	52.60	74.00	-21.40	peak			
2	4825.000	30.48	3.34	33.82	54.00	-20.18	AVG			

5. Occupied Bandwidth

5.1. Requirements (15.249):

The field strength of any emissions appearing outside the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 50 dB below the level of the carrier or to the general limits of 15.249.

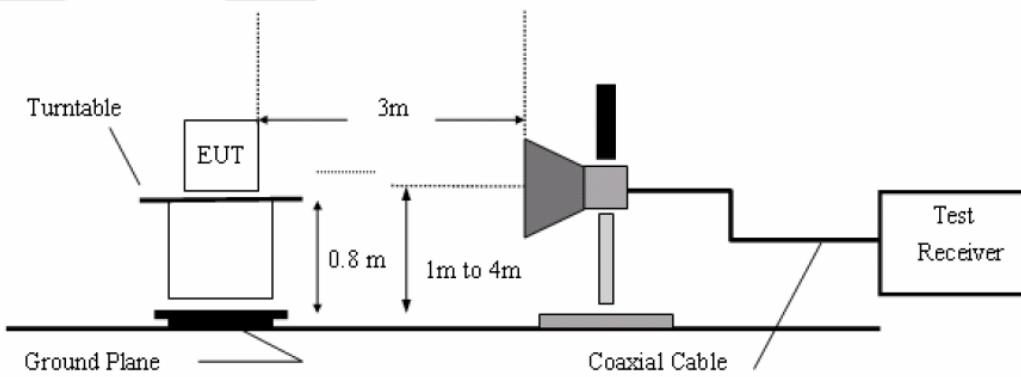
5.2. Test Procedure

The EUT is placed on a turn table which is 0.8 meter high above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.

Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde & Schwarz	ESCI	101604	Apr. 23, 2013	1 Year
2.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Apr. 23, 2013	1 Year
3.	Pre-amplifier	SONOMA	310N	186860	Apr. 23, 2013	1 Year
4.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A

5.3. Test Configuration:

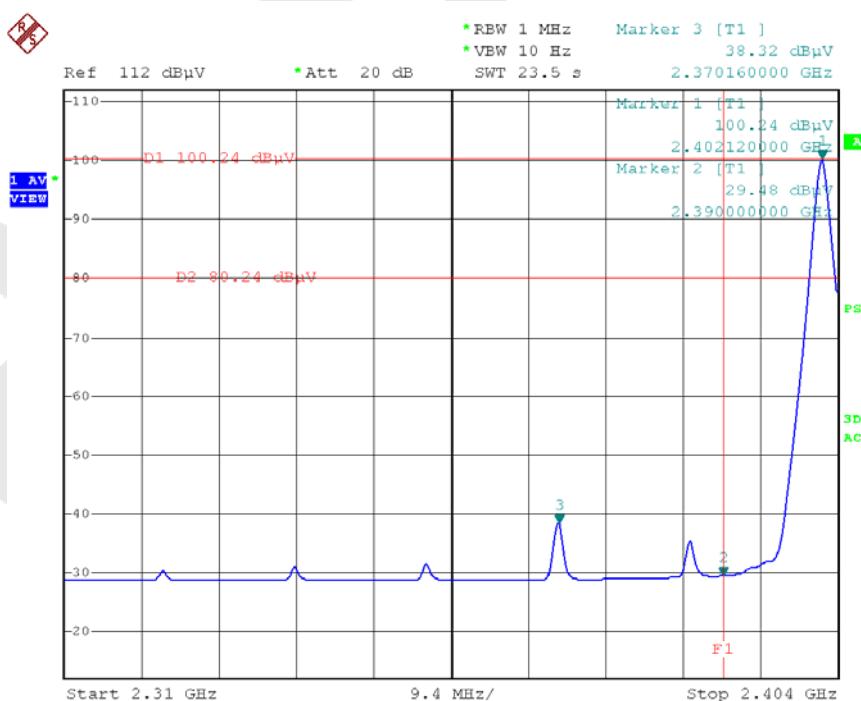
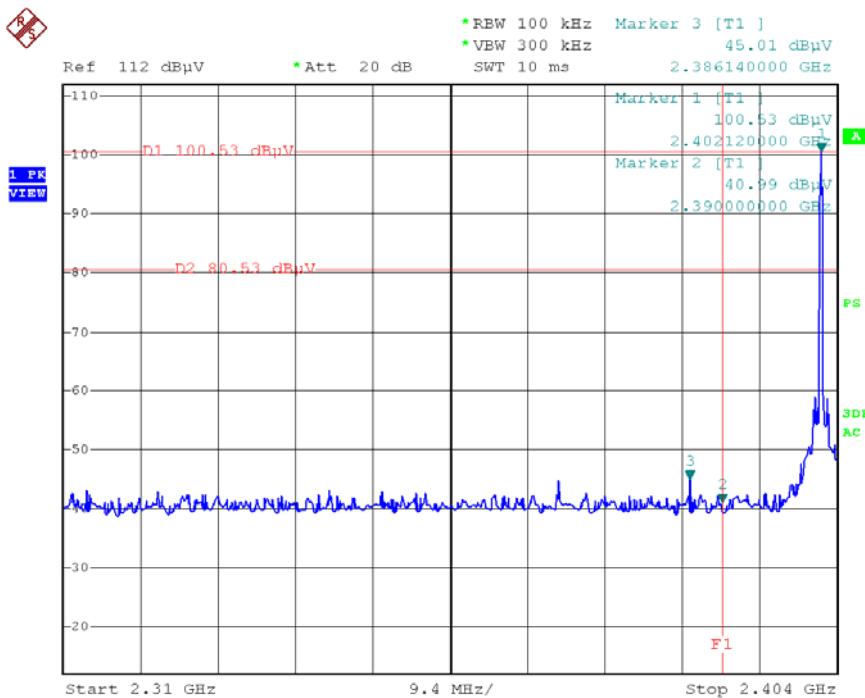


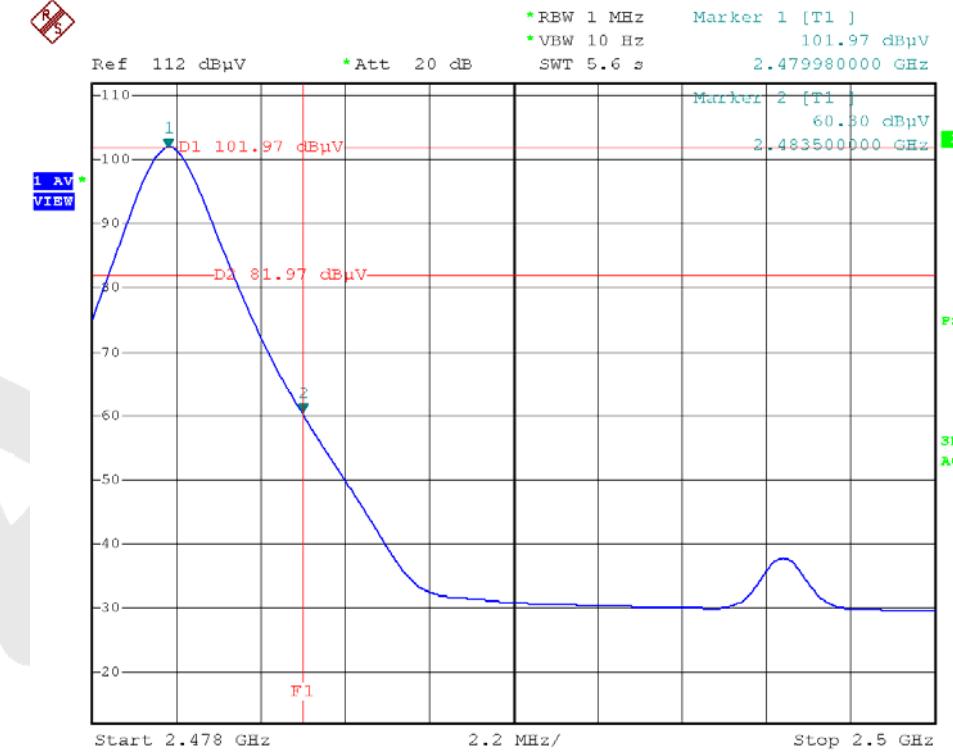
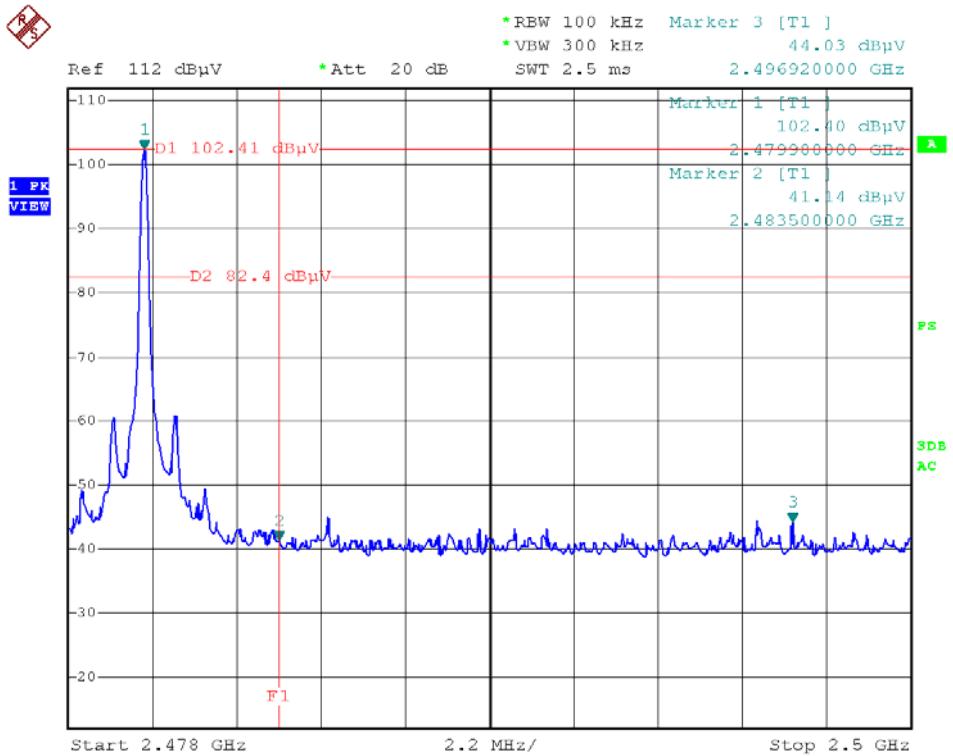
5.4. Test Results

Pass.

Please refer the following plot.

(Note: Marker 3 means the highest value in 2.39GHz~2.4GHz or 2.4835~2.5GHz)



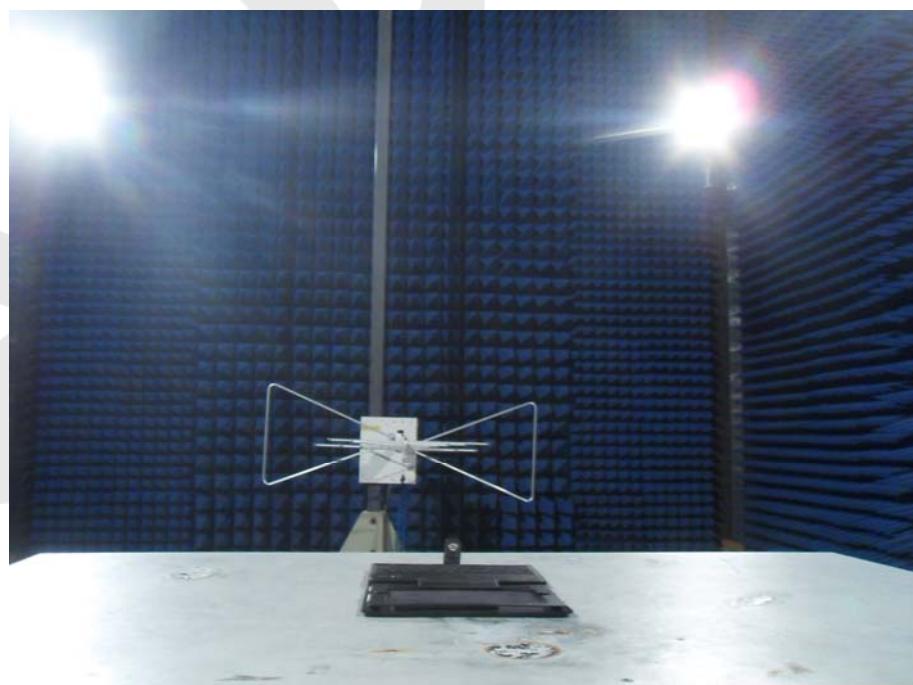


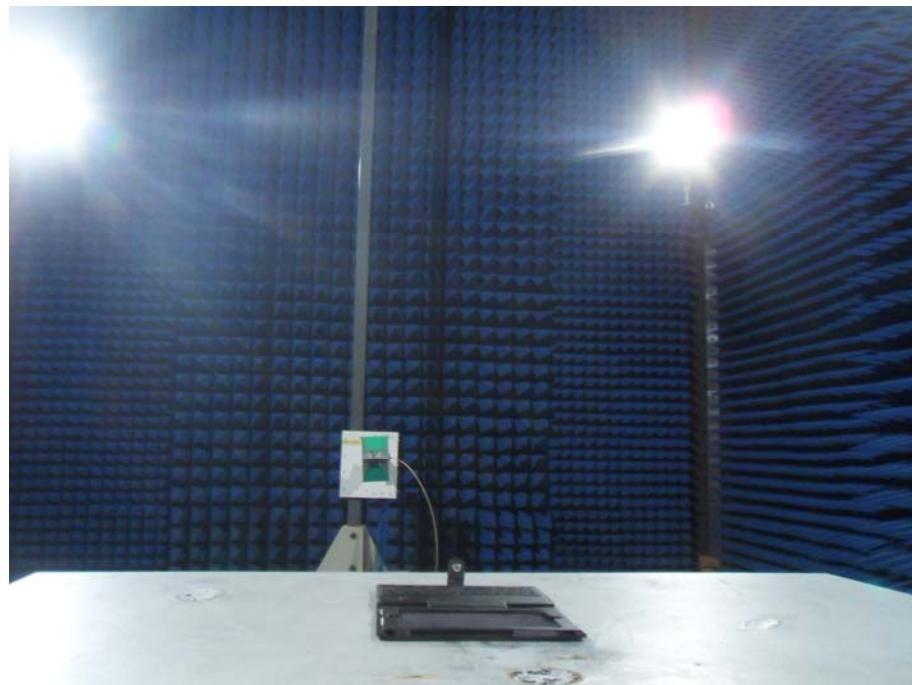
6. PHOTOGRAPH

6.1. Photo of Power Line Conducted Emission Measurement



6.2. Photo of Radiation Emission Test





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APPENDIX I (External Photos)

Figure 1
The EUT-Overall View



Figure 2
The EUT-Overall View



Figure 3
The EUT-Overall View



Figure 4
The EUT-Overall View



Figure 5
The EUT-Front View



Figure 6
The EUT-Back View



APPENDIX II (Internal Photos)

Figure 7
The EUT-Inside View



Figure 8
PCB of the EUT-Front View

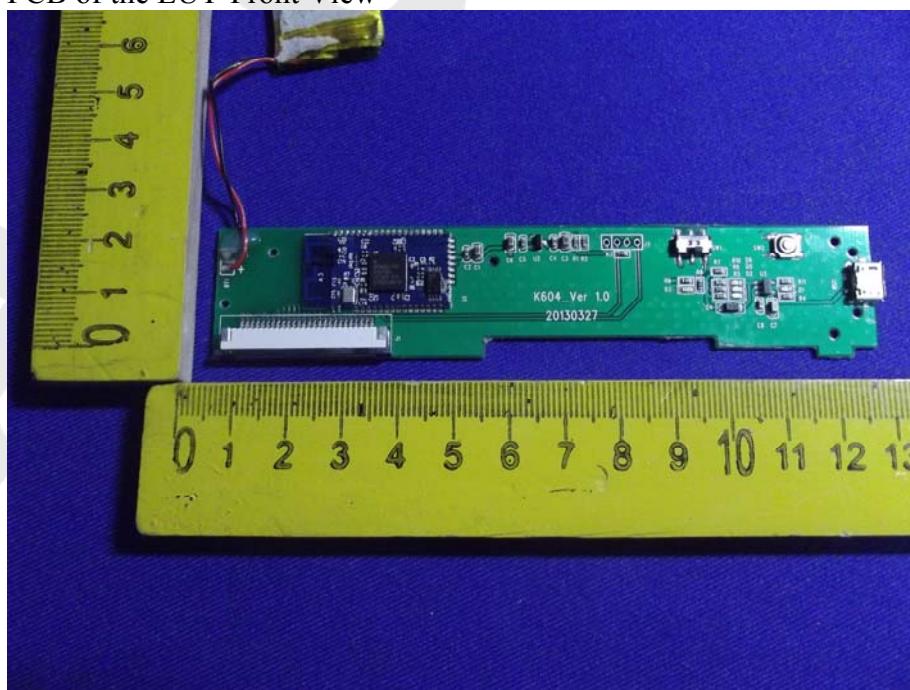


Figure 9
PCB of the EUT-Back View

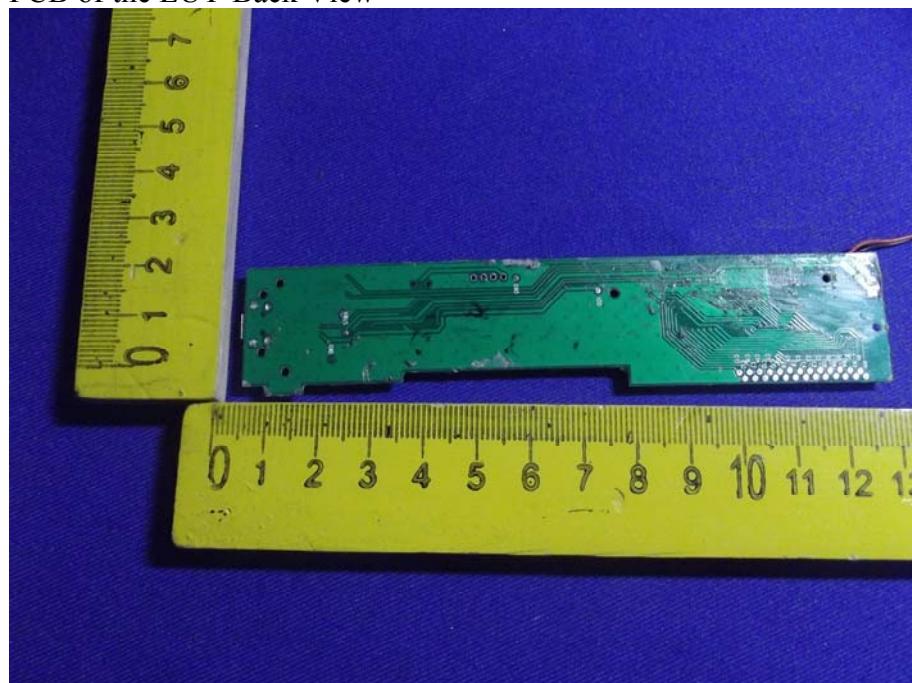


Figure 10
The EUT-Battery View

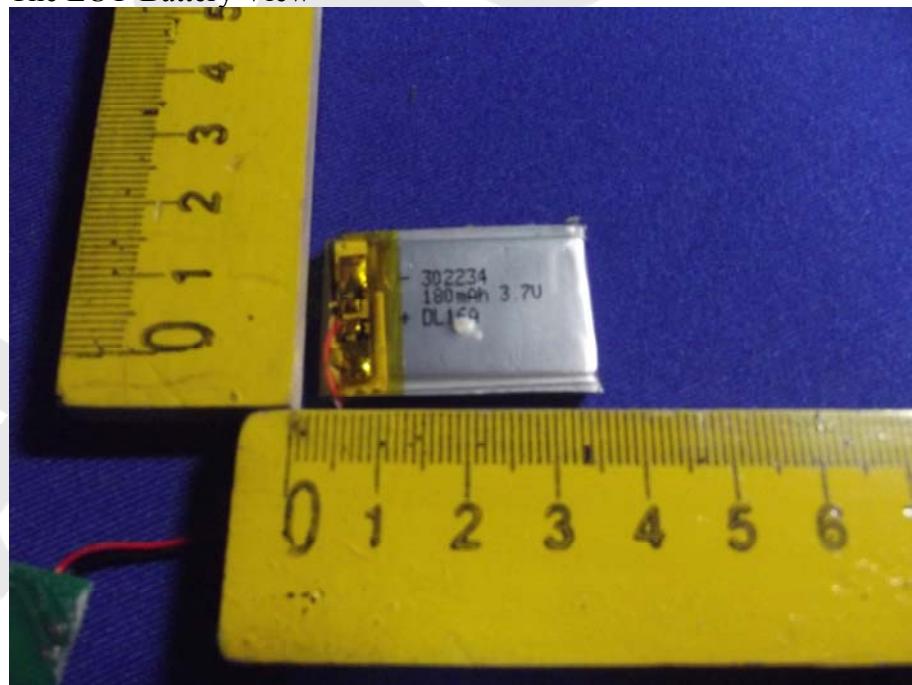


Figure 11
PCB of the BT Module View

