FCC EMC TEST REPORT

ISSUED BY
Shenzhen BALUN Technology Co., Ltd.

FOR

Lcon Wireless Bluetooth Headphone

ISSUED TO
A- Audio Headphones, Inc

7200 Corporate Center Drive Miami, Florida 33126 USA

Prepared by: Zhang Yanqing
Zhang Yanqing
(Reporting Specialist)
Date Sep 15, 2014

Approved by:
Wei Yanquan
(Chief Engineer)
Date Sep 15, 2014

Report No.:	BL-SZ1470024-401
EUT Type:	Lcon Wireless Bluetooth Headphones
Model Name:	A21, A22
Brand Name:	A AUDIO
Test Standard:	47 CFR Part 15 Subpart B
FCC ID:	2AC4GA21A22
Test conclusion:	PASS
Test Date:	Sep 01, 2014 ~ Sep 14, 2014
Date of Issue:	Sep 15, 2014

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Revision History

Version	Issue Date	Revisions
Rev. 01	Sep 15, 2014	Initial Issue

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1 GENERAL INFORMATION

1.1 Identification of the Testing Laboratory

Company Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6683 3402
Fax Number	+86 755 6182 4271

1.2 Identification of the Responsible Testing Location

Test Location	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 11524A-1. The laboratory has been listed by US Federal Communications Commission to perform electromagnetic emission measurements. The recognition numbers of test site are 832625. The laboratory has met the requirements of the IAS Accreditation Criteria for Testing Laboratories (AC89), has demonstrated compliance with ISO/IEC Standard 17025:2005. The accreditation certificate number is TL-588. The laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L6791.
Description	All measurement facilities used to collect the measurement data are located at Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055

1.3 Announce

(1) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.

(2) The test report is invalid if there is any evidence and/or falsification.

(3) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.

(4) This document may not be altered or revised in any way unless done so by BALUN and all revisions are duly noted in the revisions section.

(5) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

2 PRODUCT INFORMATION

2.1 Applicant

Applicant	A- Audio Headphones, Inc
Address	7200 Corporate Center Drive Miami, Florida 33126 USA

2.2 Manufacturer

Manufacturer	OCVACO Electronic Limited
Address	No 142, South Tanshen Road, Tanzhou Town, Zhongshan City, Guangdong, China

2.3 General Description for Equipment under Test (EUT)

EUT Type	Lcon Wireless Bluetooth Headphones
Model Name	A21
Series Model Name	A21, A22
Description of Model name differentiation	The equipment model A21 and A22 are the Lcon Wireless Bluetooth Headphones, the electrical parameters and internal structure of circuit are same, only the model is different.
Band Name	N/A
Hardware Version	V1.2
Software Version	V1.2
Input voltage	DC 5V
Input current	1.0A
Network and Wireless connectivity	Bluetooth 3.0, Bluetooth 4.0 Low Energy (BLE)
About the Product	The equipment is Lcon Wireless Bluetooth Headphones, operating at 2.4GHz ISM band. Which supports dual mode Bluetooth 4.0.

2.4 Ancillary Equipment

Ancillary Equipment 1	Audio Line	
Ancillary Equipment 2	Audio Line(Control)	
Ancillary Equipment 3	Battery	
	Brand Name	N/A
	Model No	PT602248
	Serial No	N/A
	Capacitance	650mAh
	Rated Voltage	3.7V
	Extreme Voltage	Low: 3.3V / High:4.2V

3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	FCC 47 CFR Part 15 Subpart B (10-1-09 Edition)	Unintentional Radiators
2	ANSI C63.4-2009	American National Standard for Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

3.2 Verdict

No.	Description	FCC Rule	Test Verdict	Result
1	Radiated Emission	15.109	PASS	Annex A .1
2	Conducted Emission, DC Ports	15.107	PASS	Annex A .2

3.3 Test Uncertainty

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2.This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement	Value
Conducted emissions (9KHz-30MHz)	1.12dB
Radiated emissions (30MHz-1GHz)	2.11dB
Radiated emissions (1GHz-18GHz)	3.31dB

4 GENERAL TEST CONFIGURATIONS

4.1 Test Environments

Environment Parameter	Selected Values During Tests		
	Temperature	Voltage	Relative Humidity
Normal Temperature, Normal Voltage (NTNV)	23°C~25°C	DC 5.0V	50%-55%

4.2 Test Equipment List

Radiated Emission Test						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2014.07.07	2015.07.06	☒
Test Antenna-Loop(9kHz-30MHz)	SCHWARZBECK	FMZB 1519	1519-037	2013.07.02	2015.07.01	☒
Test Antenna-Bi-Log(30MHz-3GHz)	SCHWARZBECK	VULB 9163	9163-624	2013.07.03	2015.07.02	☒
Test Antenna-Horn(1-18GHz)	SCHWARZBECK	BBHA 9120D	9120D-1148	2013.07.02	2015.07.01	☒
Test Antenna-Horn(15-26.5GHz)	SCHWARZBECK	BBHA 9170	9170-305	2013.07.02	2015.07.01	☐
Anechoic Chamber	RAINFORD	9m*6m*6m	N/A	2013.10.07	2014.10.06	☒

Conducted disturbance Test						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2014.07.07	2015.07.06	☒
LISN	SCHWARZBECK	NSLK 8127	8127-687	2014.07.07	2015.07.06	☐
AMN	SCHWARZBECK	NNBM8124	8124-509	2014.07.07	2015.07.06	☒
AMN	SCHWARZBECK	NNBM8124	8124-510	2014.07.07	2015.07.06	☒
ISN	TESEQ	ISN T800	34449	2014.07.07	2015.07.06	☐

4.3 Test Enclosure list

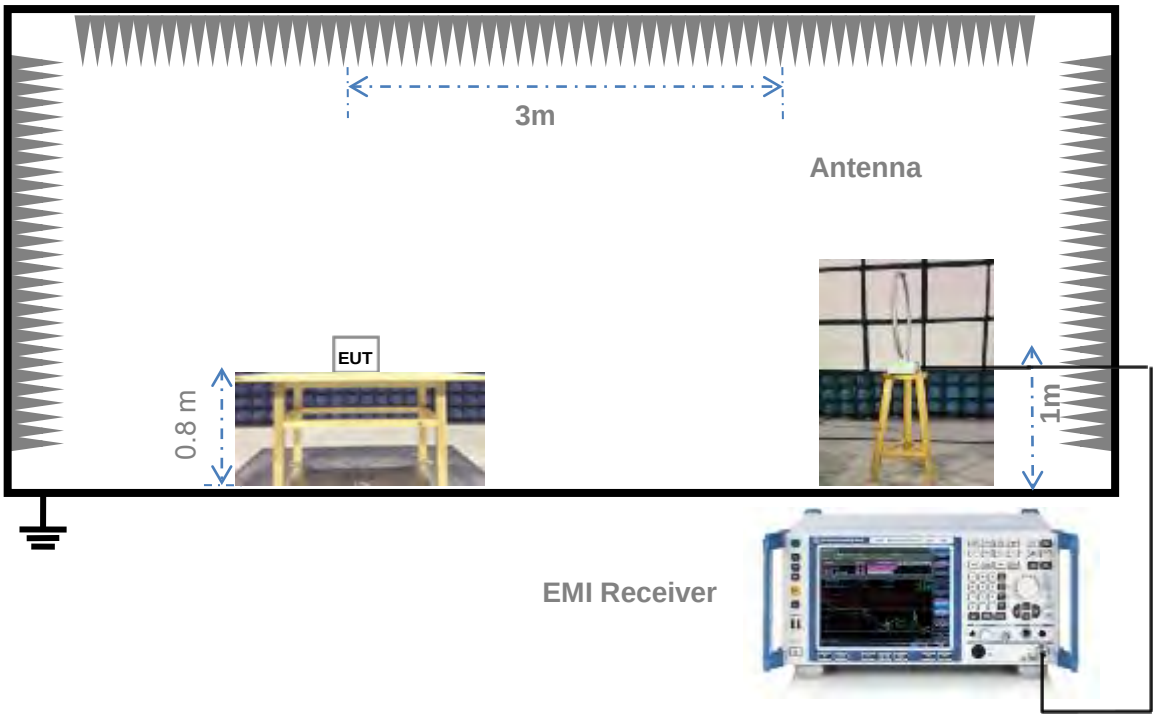
Description	Manufacturer	Model	Serial No.	Length	Description	Use
PC	N/A	N/A	N/A	N/A	Special Handled	☐
Printer	HP	DESKJET 1000	N/A	N/A	N/A	☐
Keyboard	Logitech	Y-BP62a	N/A	N/A	N/A	☐
Mouse	Logitech	M100	N/A	N/A	N/A	☐
USB disk	Kingston	N/A	N/A	N/A	N/A	☐
USB Data Cable	N/A	N/A	N/A	N/A	N/A	☒
TF Card	Kingston	N/A	N/A	N/A	N/A	☐
VGA Cable	N/A	N/A	N/A	1.5m	Shielded with core	☐
HDMI Cable	N/A	N/A	N/A	1.5m	Shielded with core	☐
DVI Cable	N/A	N/A	N/A	1.5m	Shielded with core	☐
Coaxial video cable	N/A	N/A	N/A	2m	Shielded with core	☐
Phone	BBK	HCD007TSD	N/A	N/A	N/A	☒
laptop	LENOVO	K29	N/A	N/A	N/A	☒

4.4 Test Configurations

Test Configurations (TC) No.	Description
TC01	The Bluetooth test mode The EUT configuration of the emission tests is EUT + iPhone. During the measurement. A Bluetooth link was established between the EUT and the iPhone, the EUT was working normally as a music player.
TC02	The USB Cable test mode The EUT configuration of the emission tests is EUT + Laptop +USB Cable During the measurement, the USB cable is connected with the EUT and.laptop, the EUT was working normally.
TC03	The Audio Line test mode The EUT configuration of the emission tests is EUT+ iPhone +Audio line. During the measurement, the Audio Line is connected with the EUT and the iPhone, the EUT was working normally as a music player.
TC04	The Audio Line(Control) test mode During the measurement, the sound control line is connected with the EUT and the iPhone, and Audio Line (Control) can control the EUT play the music.
TC05	The Idle mode The EUT configuration of the emission tests is only EUT. During the measurement, the EUT is connected with nothing and working normally.

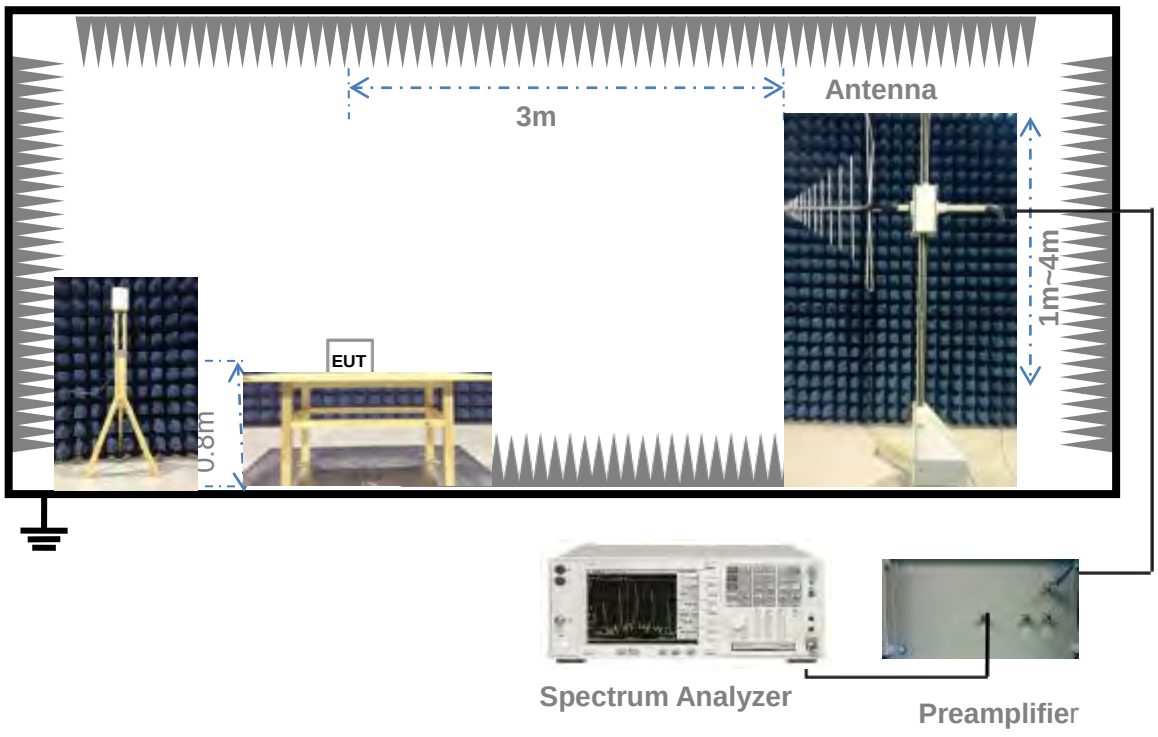
4.5 Test Setups

Test Setup 1



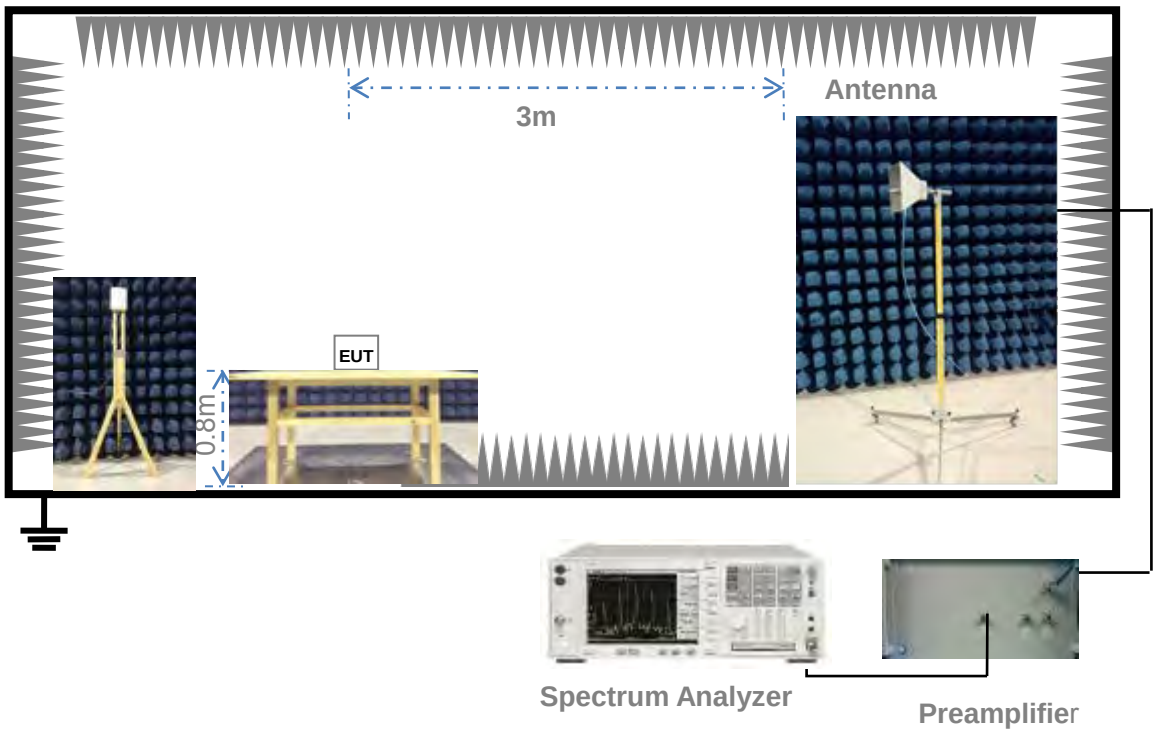
For Radiated Emission Test (Below 30MHz))

Test Setup 2



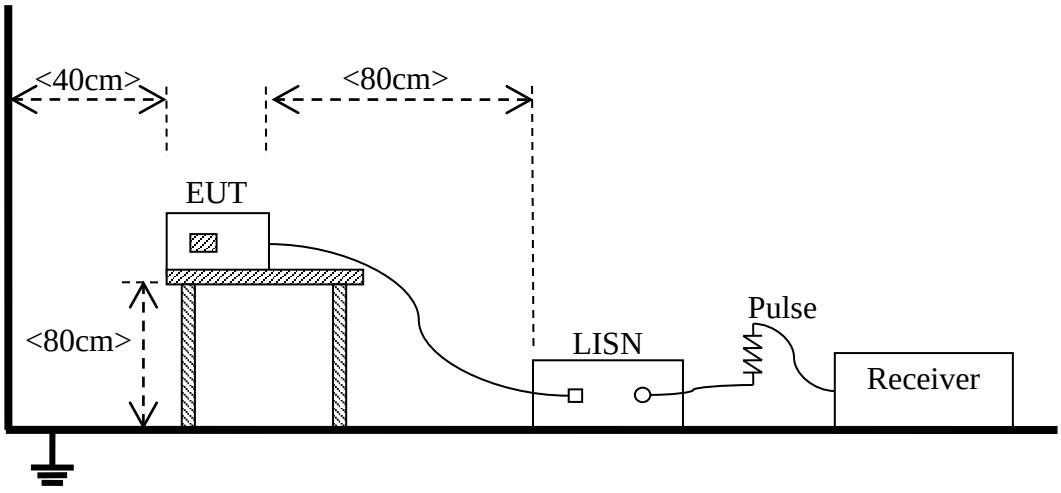
(For Radiated Emission Test (30MHz-1GHz))

Test Setup 3



(For Radiated Emission Test (above 1GHz))

Test Setup 4



(For Conducted Emission, AC Ports Test)

4.6 Test Conditions

Test Case	Test Conditions	
Radiated Emission	Test Env.	NTNV
	Test Setup	Test Setup 1&3
	Test Configuration	TC01~TC05 Note
Conducted Emission(Connected to PC Pots, PC mains)	Test Env.	NTNV
	Test Setup	Test Setup 4
	Test Configuration	TC01~TC05 Note

Note: Based on client request, all normal using modes of the normal function were tested but only the worst test data of the worst mode is reported by this report.

5 TEST ITEMS

5.1 Emission Tests

5.1.1 Radiated Emission

5.1.1.1 Limit

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

NOTE:

1) Field Strength (dBμV/m) = 20*log [Field Strength (μV/m)].
2) In the emission tables above, the tighter limit applies at the band edges.
3) For above 1000MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK)

5.1.1.2 Test Procedure

All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

An initial pre-scan was performed in the chamber using the EMI Receiver in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by Bi-Log antenna with 2 orthogonal polarities.

5.1.2 Conducted Emission

5.1.2.1 Test Limit

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:

1) The limit is applicable to Class B ITE.
2) The lower limit shall apply at the band edges.
3) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

5.1.2.2 Test Procedure

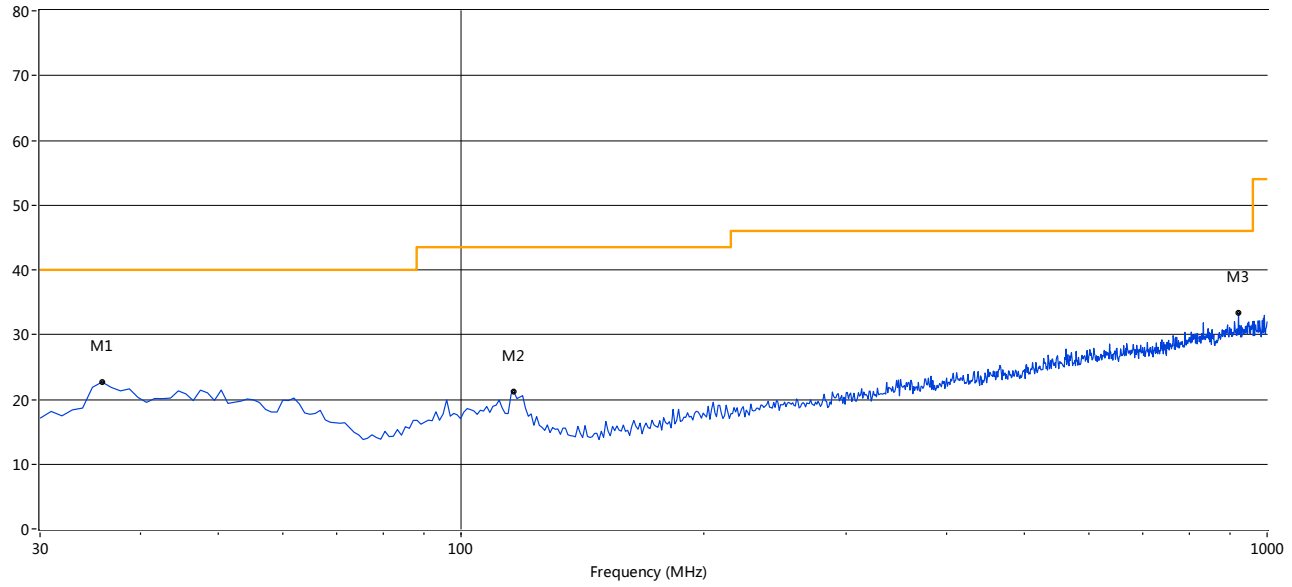
The EUT is connected to the power mains through a LISN which provides 50Ω/50μH of coupling impedance for the measuring instrument. The test frequency range is from 150 kHz to 30MHz. The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels that are more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed.

ANNEX A TEST RESULTS

A.1 Radiated Emission

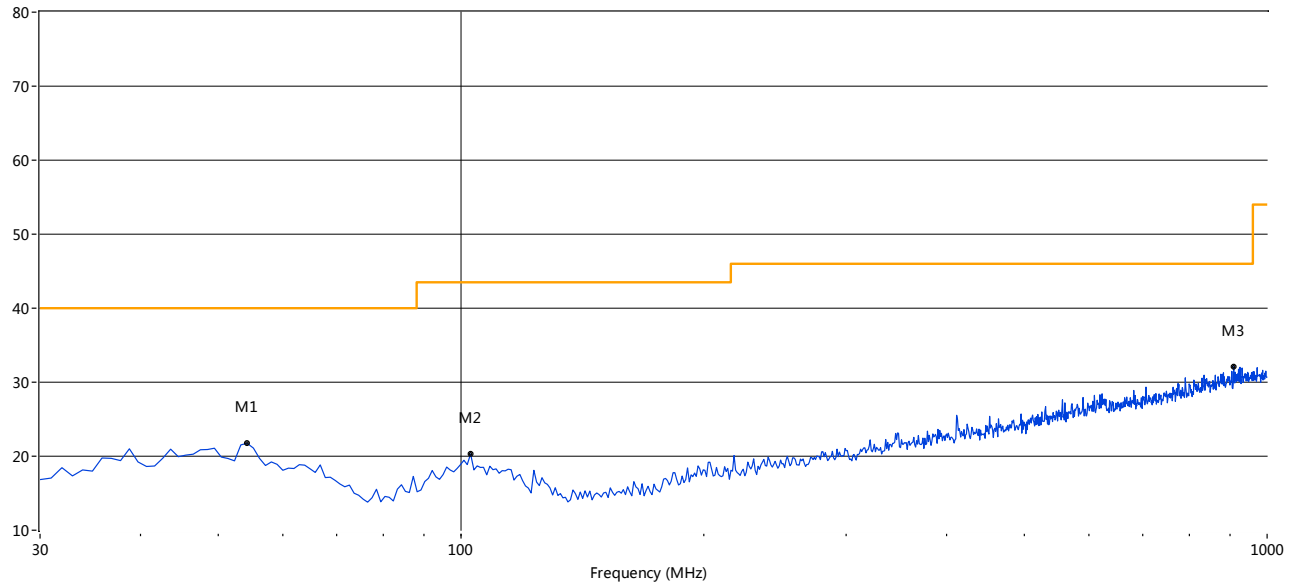
Test Data and Plots

A.1.1 Test Antenna Vertical, 30MHz – 1GHz



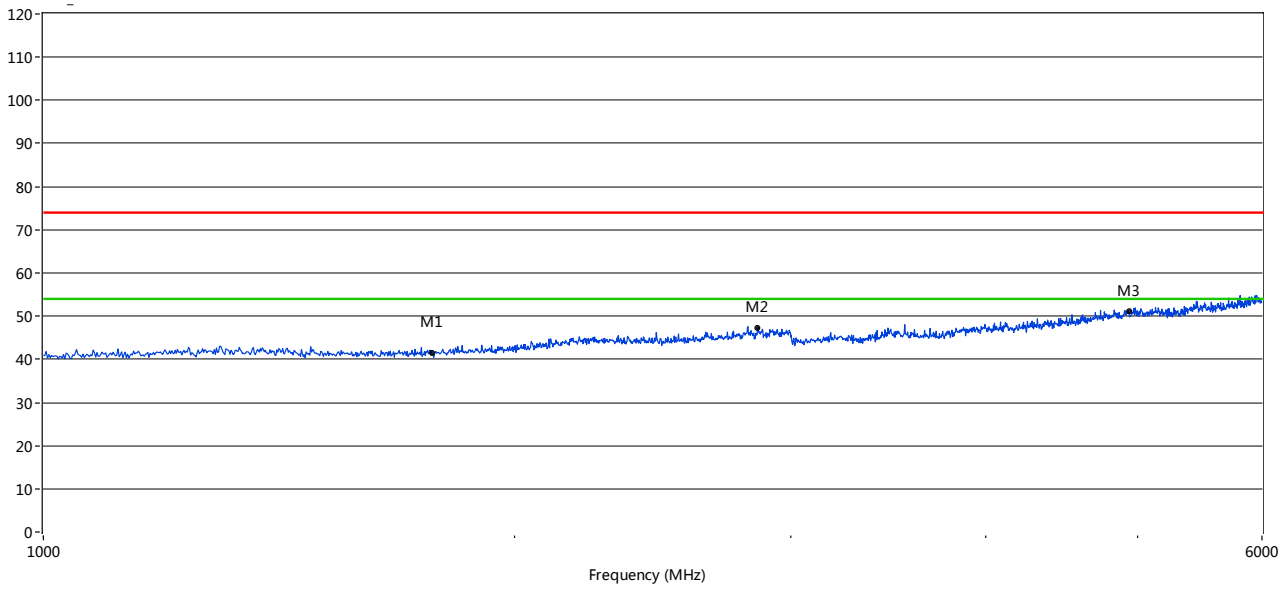
Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
35.81	22.68			-20.86	40.0	40.0	--	17.32	97.20	100	Vertical	Pass
116.24	21.13			-21.20	40.0	40.0	--	18.87	15.10	100	Vertical	Pass
921.51	33.32			-5.73	47.0	47.0	--	13.68	253.90	100	Vertical	Pass

A.1.2 The Antenna Horizontal , 30MHz – 1GHz



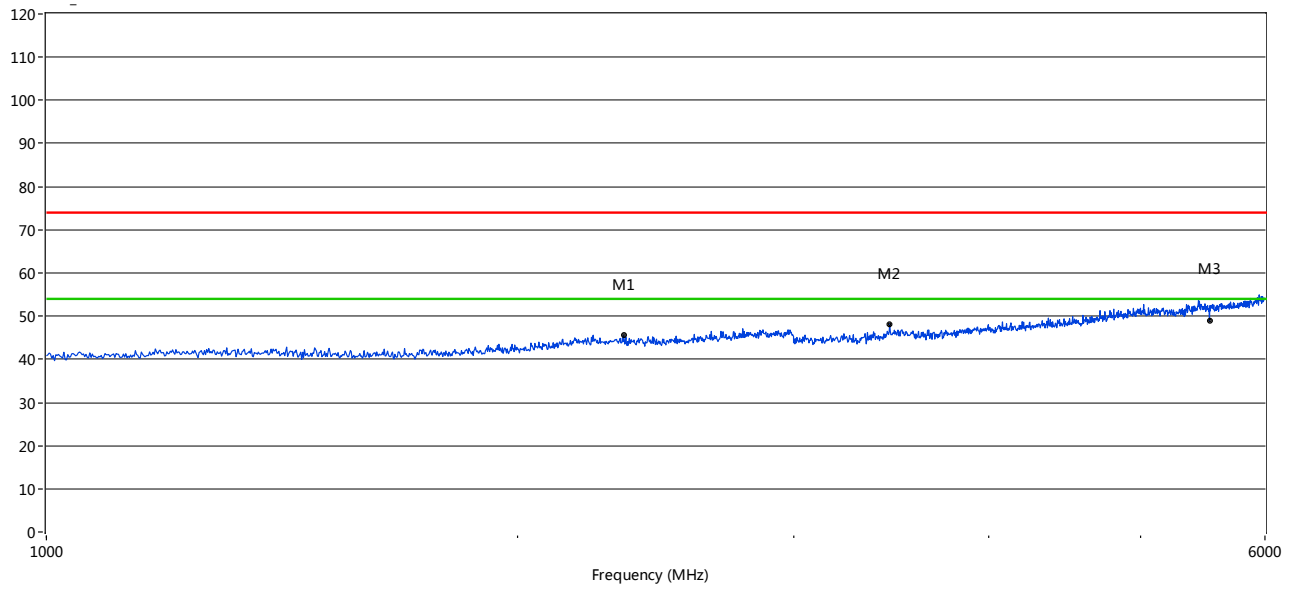
Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
54.23	21.75			-18.55	--	40.0	--	18.25	359.80	100	Horizontal	Pass
102.68	20.31			-20.07	--	43.5	--	23.19	326.40	100	Horizontal	Pass
908.91	32.10			-6.06	--	46.0	--	13.90	299.30	100	Horizontal	Pass

A.1.3 The Antenna Vertical ,1GHz– 6GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1771.23	41.37			-3.83	74.0	--	54.0	12.63	0.40	100	Vertical	Pass
2858.14	47.38			2.38	74.0	--	54.0	6.62	201.80	100	Vertical	Pass
4933.07	51.18			12.49	74.0	--	54.0	2.82	204.60	100	Vertical	Pass

A.1.4 The Antenna Horizontal , 1GHz– 6GHz

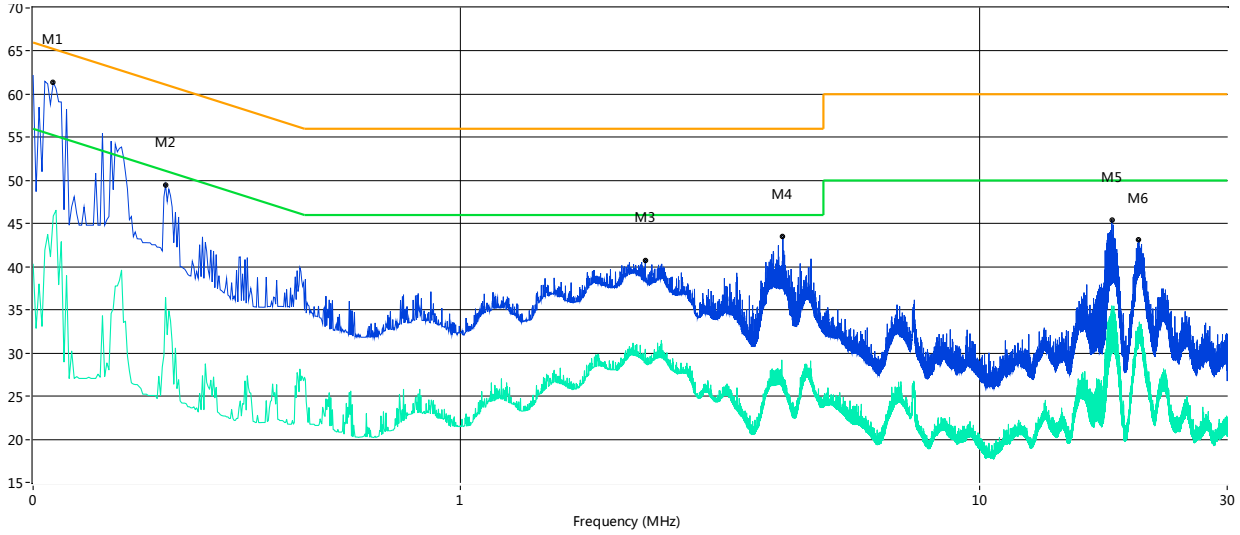


Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
2336.66	45.51			-0.64	70.0	--	50.0	4.49	-0.00	100	Horizontal	Pass
3455.54	48.07			9.07	74.0	--	54.0	5.93	141.00	100	Horizontal	Pass
5529.87	49.00	--	35.49	13.42	74.0	--	54.0	18.51	131.00	100	Horizontal	Pass

A.2 Conducted Emission

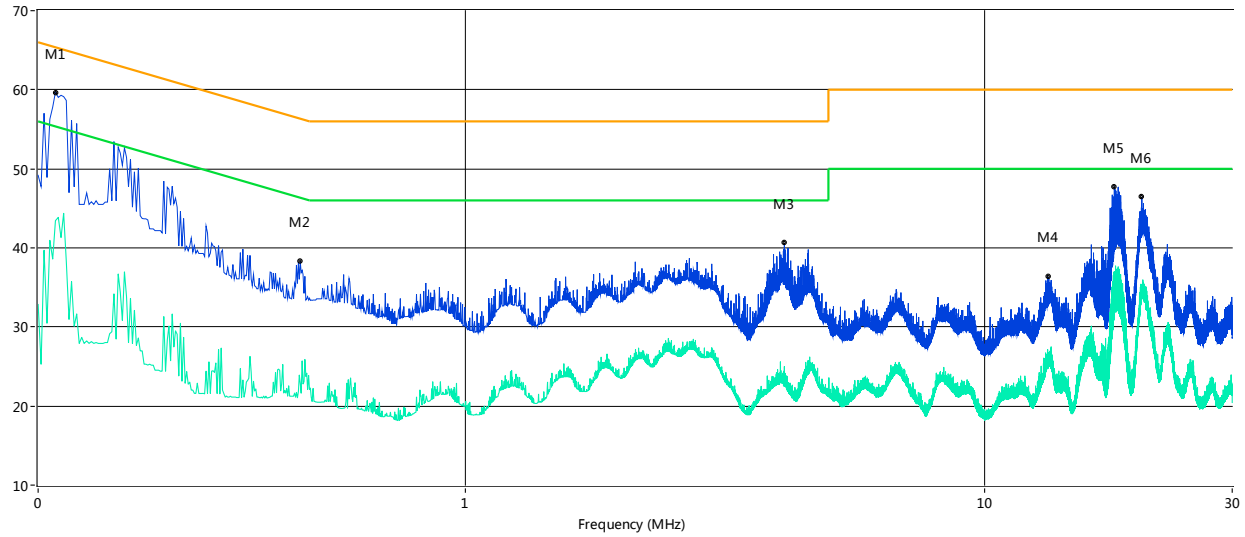
Test Data and Plots

A.2.1 L Phase



Frequency (MHz)	Peak Level (dBuV)	Q-peak Level (dBuV)	Average Level (dBuV)	Factor (dB)	QP Limit (dBuV)	AV Limit (dBuV)	Margin (dB)	Line	Verdict
0.16	61.4	--	45.9	10.00	65.6	55.6	9.70	L Line	PASS
0.27	49.5	--	36.4	10.00	62.6	52.6	16.20	L Line	PASS
2.27	40.8	--	30.4	10.00	56.0	46.0	15.60	L Line	PASS
4.18	43.5	--	27.2	10.00	56.0	46.0	18.80	L Line	PASS
17.98	45.4	--	35.5	10.00	60.0	50.0	14.50	L Line	PASS
20.27	43.1	--	32.8	10.00	60.0	50.0	17.20	L Line	PASS

A.2.2 N Phase

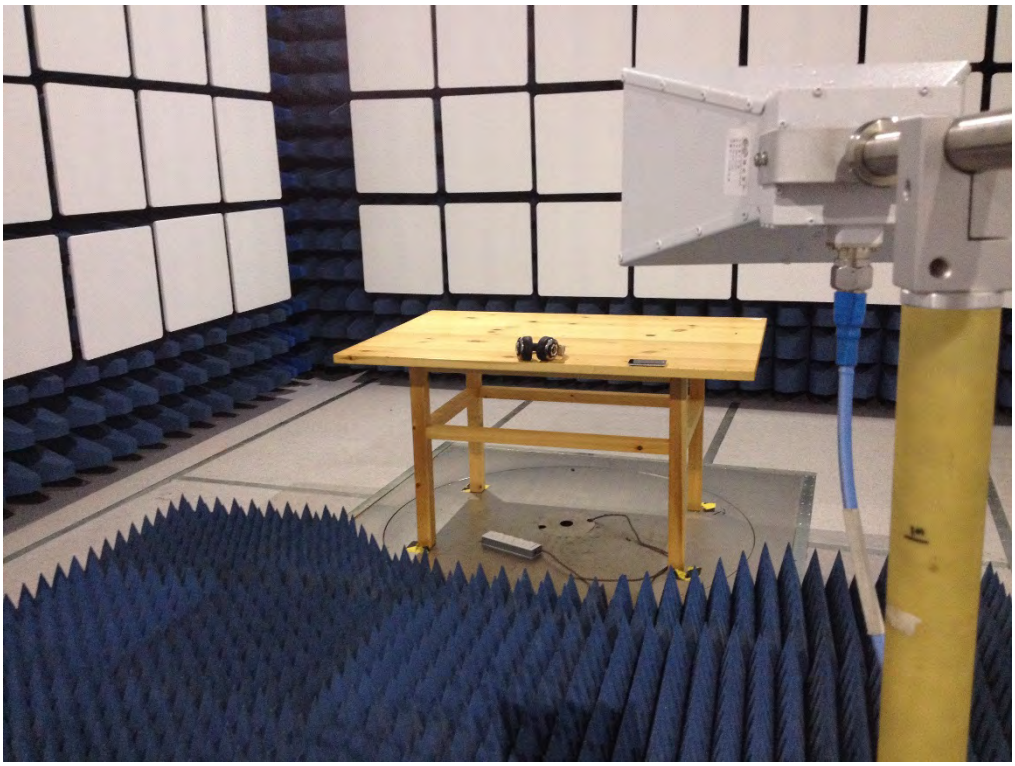


Frequency (MHz)	Peak Level (dBuV)	Q-peak Level (dBuV)	Average Level (dBuV)	Factor (dB)	QP Limit (dBuV)	AV Limit (dBuV)	Margin (dB)	Line	Verdict
0.16	59.7	--	43.4	10.00	65.7	55.7	12.30	N Line	PASS
0.48	38.3	--	22.8	10.00	56.6	46.6	23.80	N Line	PASS
4.11	40.6	--	25.0	10.00	56.0	46.0	21.00	N Line	PASS
13.23	36.4	--	27.1	10.00	60.0	50.0	22.90	N Line	PASS
17.78	47.8	--	36.9	10.00	60.0	50.0	13.10	N Line	PASS
20.09	46.4	--	34.0	10.00	60.0	50.0	16.00	N Line	PASS

ANNEX B TEST SETUP PHOTOS

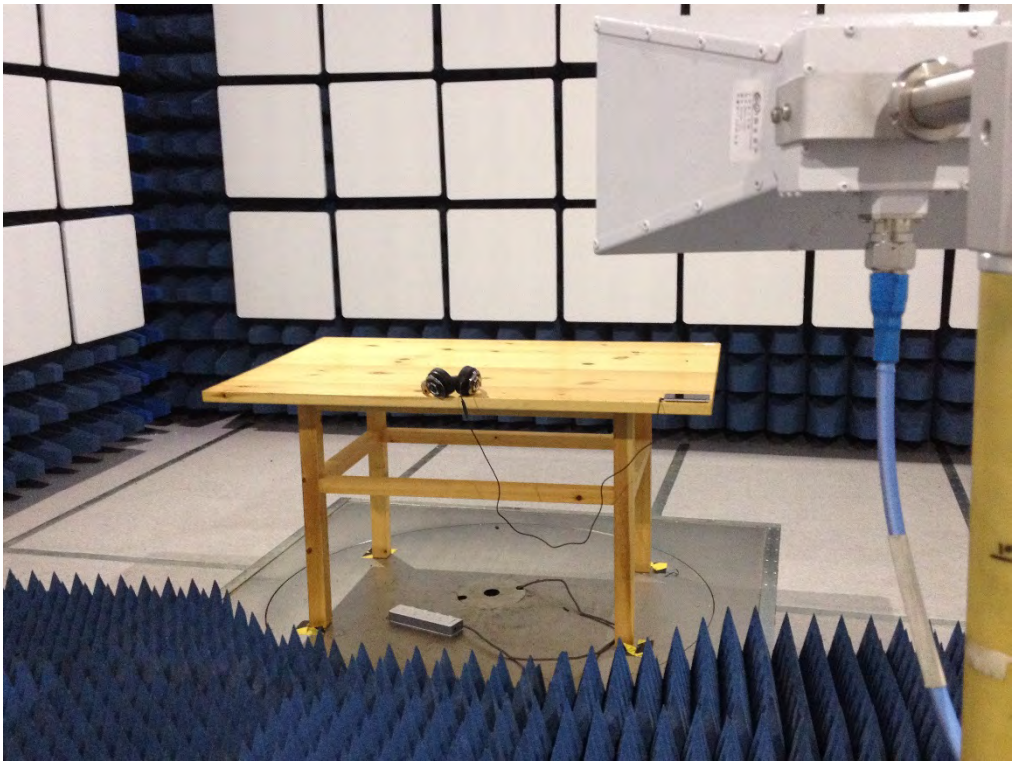
B.1 Radiated Field Strength Measurement

30MHz~1GHz (The Bluetooth Test Mode)



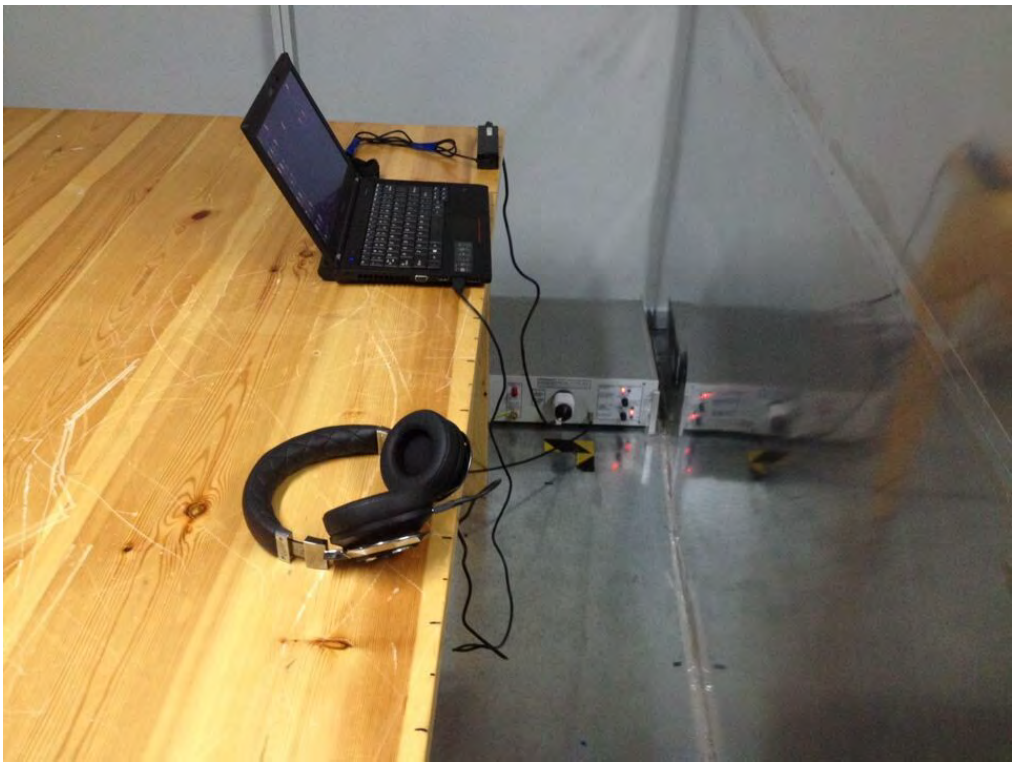
1GHz~6GHz (The Bluetooth Test Mode)

30MHz~1GHz (The Sound Control Line Test Mode)



1GHz~6GHz (The Sound Control Line Test Mode)

B.2 Conducted Emission



ANNEX C EUT PHOTOS

C.1 Appearance of the EUT

THE FRONT OF EUT

THE BACK OF EUT

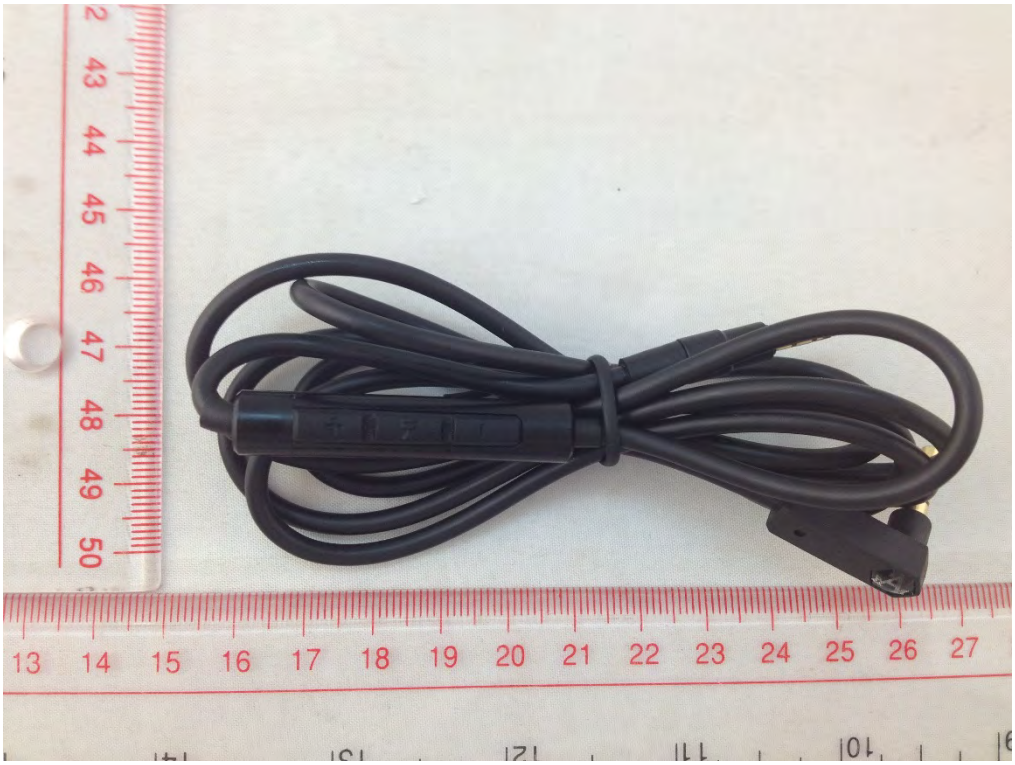
THE LEFT OF EUT

THE RIGHT OF EUT

THE UP OF EUT

THE DOWN OF EUT

Audio Line



Audio Line (Control)

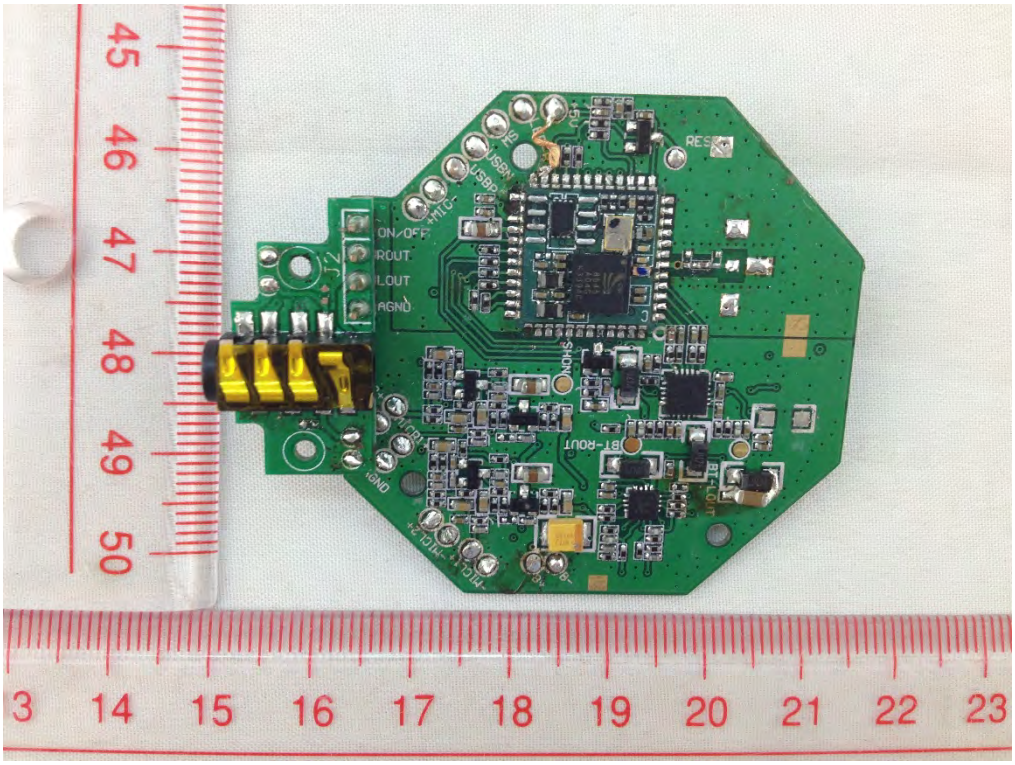
C.2 Inside of the EUT

OPEN THE EUT PHOTO

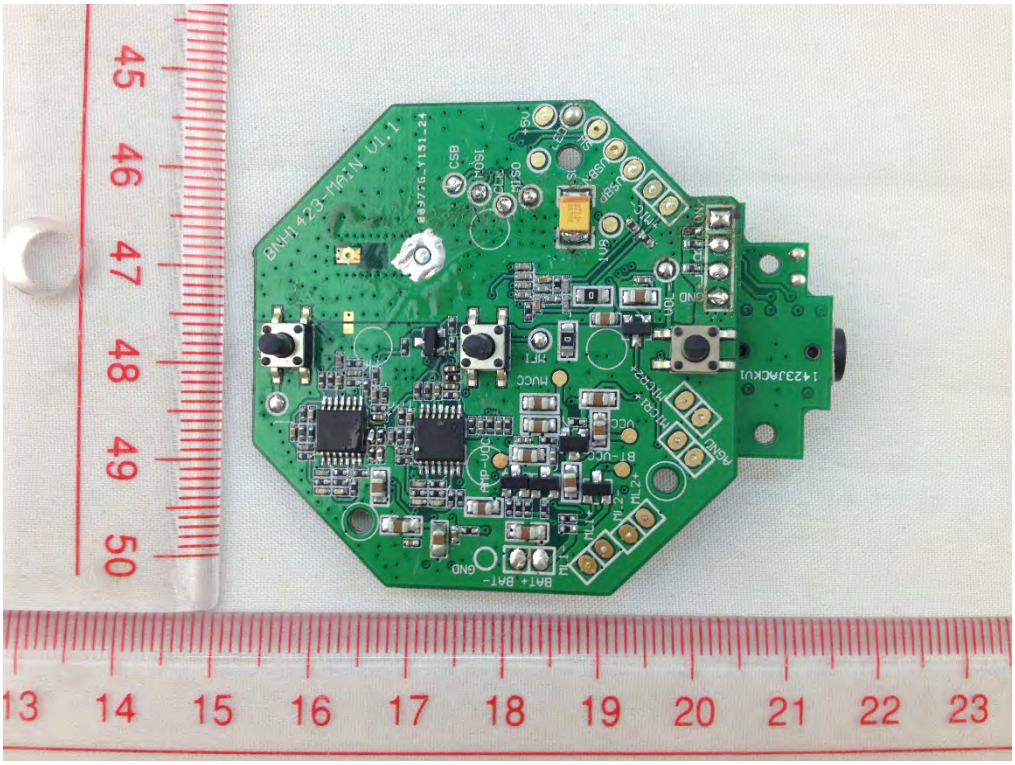
OPEN THE EUT PHOTO 2

EUT INTERNAL BOARD 1

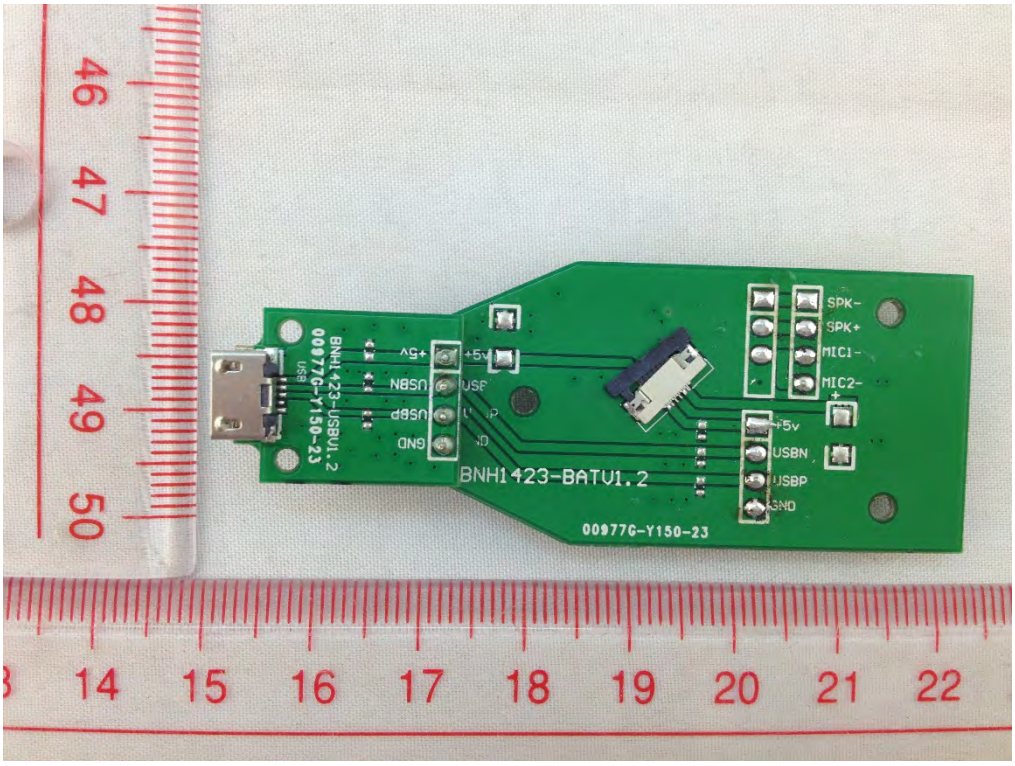
EUT INTERNAL BOARD 2



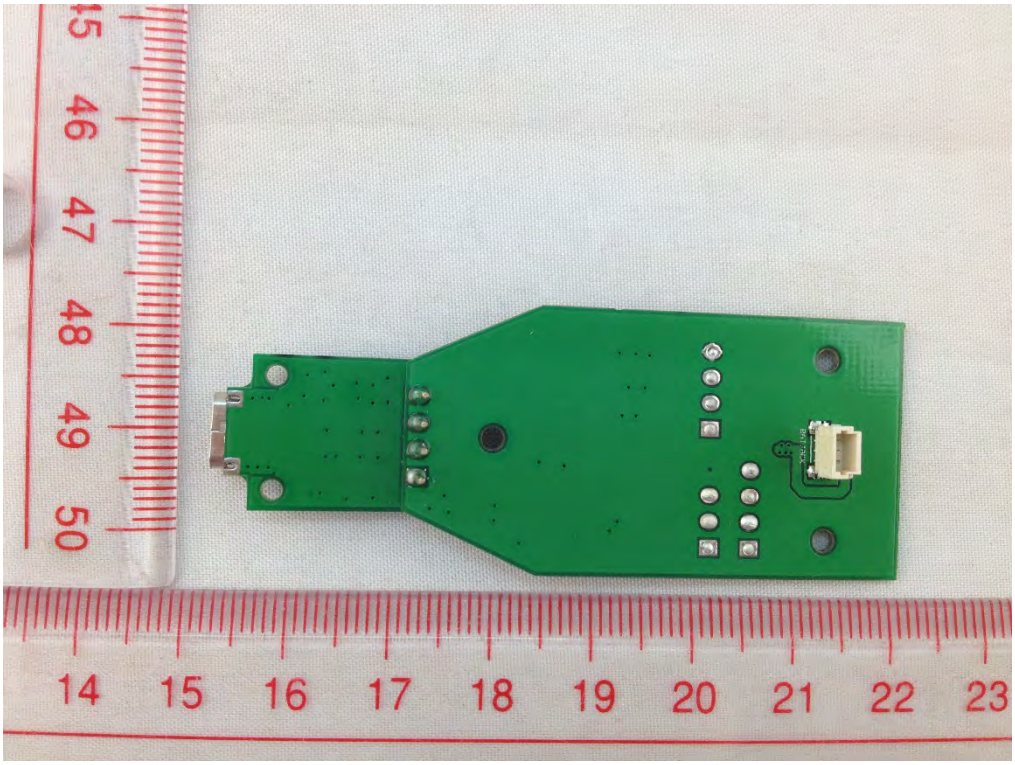
EUT INTERNAL BOARD 3



EUT INTERNAL BOARD4



EUT INTERNAL BOARD 5



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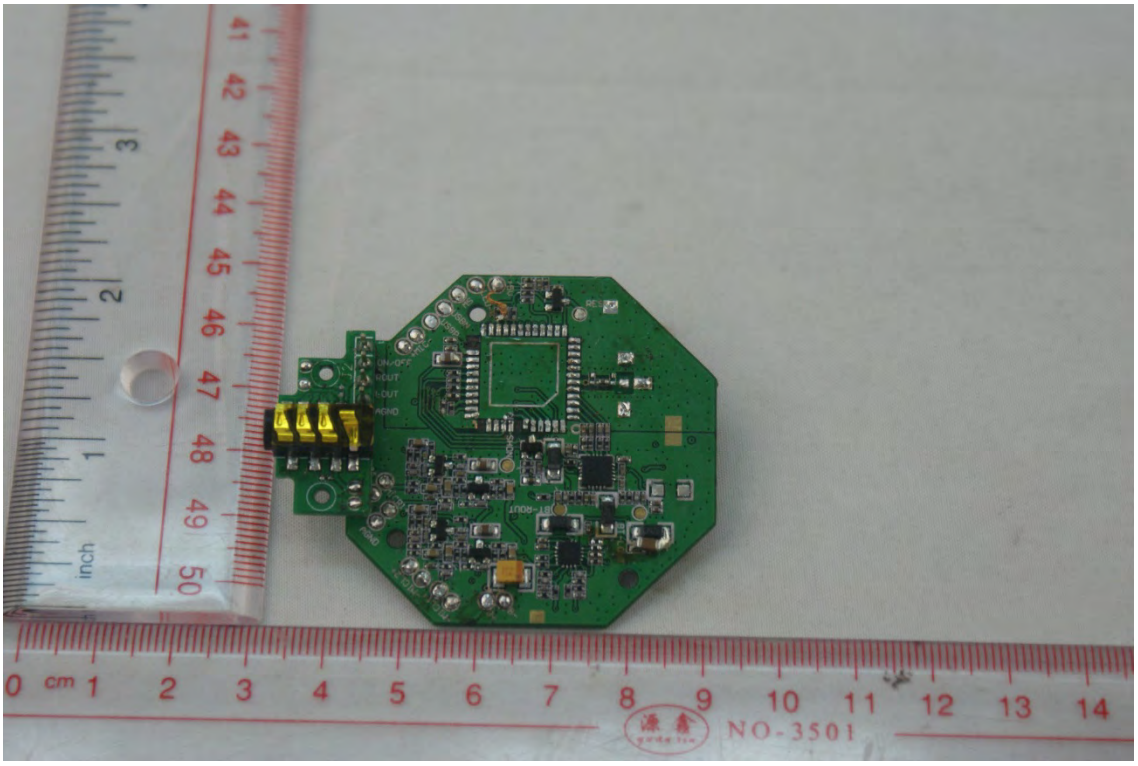
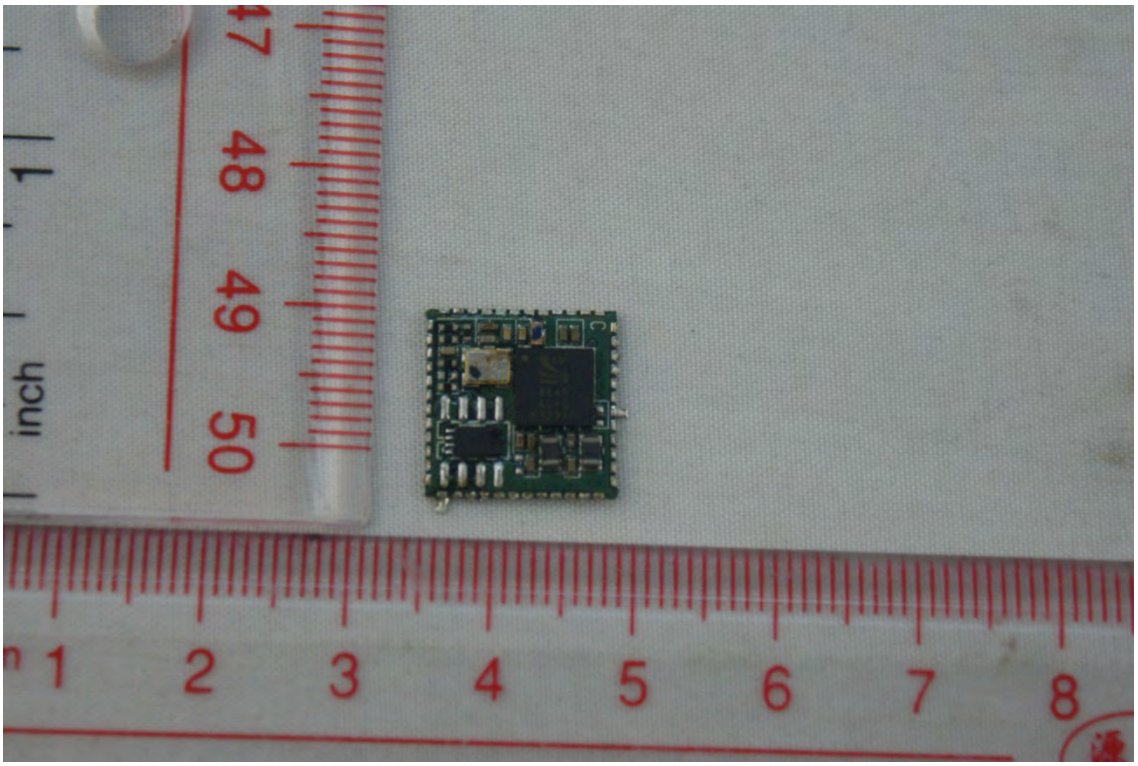
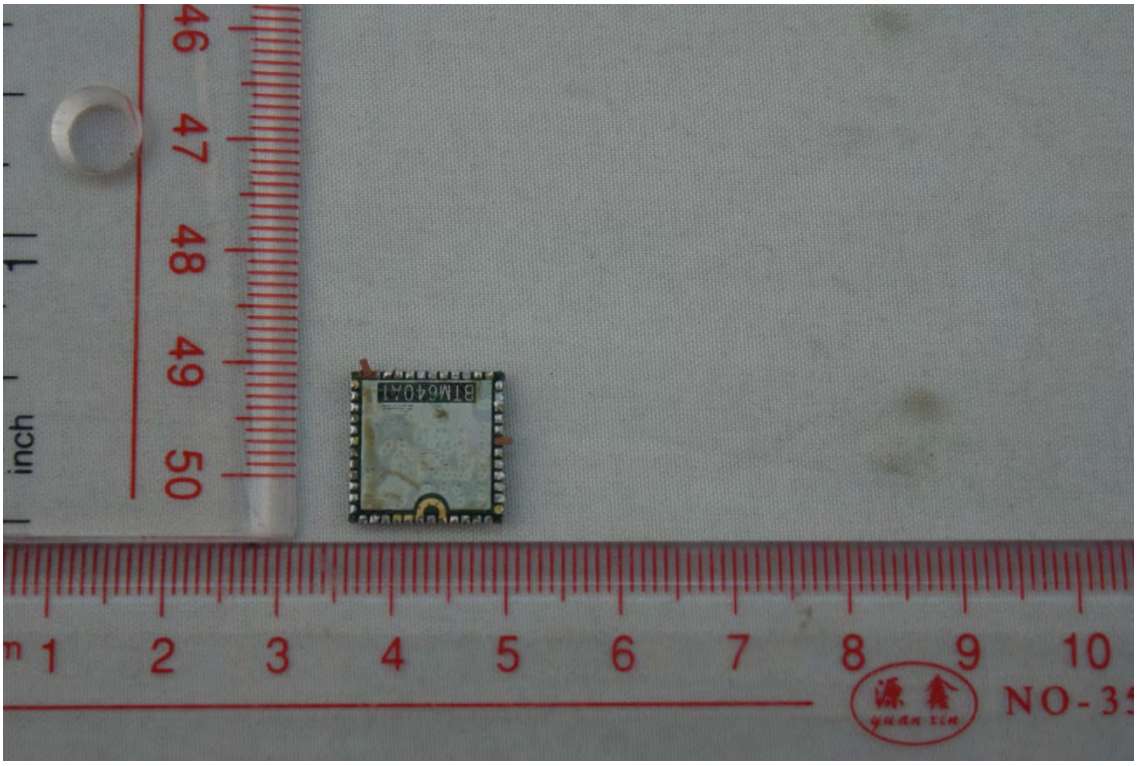


EUT INTERNAL BOARD 7



EUT INTERNAL BOARD 8



EUT INTERNAL BOARD 9

--END OF REPORT--