FCC Test Report

Report No.: AGC01974140603FE08

FCC ID	:	OR8-T1
TYPE OF AUTHORIZATION	:	15B Certification
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Bluetooth Headphone
BRAND NAME	:	microlab
TEST MODEL	:	T1
CLIENT	:	Microlab Electronics Co.,Ltd.
DATE OF ISSUE	:	Jul.11, 2014
STANDARD(S)	:	FCC Part 15 Rules
REPORT VERSION	:	V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jul.11, 2014	Valid	Original Report

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1. VERIFICATION OF COMPLIANCE

Applicant	Microlab Electronics Co.,Ltd.
Address	Baozi South Road, Shenzhen Microlab Industrial Park, Shenzhen Grand Industrial Zone, PingShan New District, Shenzhen, GuangDong, China
Manufacturer	Microlab Electronics Co.,Ltd.
Address	Baozi South Road, Shenzhen Microlab Industrial Park, Shenzhen Grand Industrial Zone, PingShan New District, Shenzhen, GuangDong, China
Product Designation	Bluetooth Headphone
Brand name:	microlab
Test Model	T1
Date of test:	Jul.08, 2014 to Jul.10, 2014
Deviation:	None
Condition of Test Sample	Normal

The above equipment was tested by Attestation Of Global Compliance Co., Ltd. for compliance with the requirements set forth in the FCC Rules and Regulations Part 15, the measurement procedure according to ANSI C63.4:2003. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment are within the compliance requirements.

The test results of this report relate only to the tested sample identified in this report.

Prepared By	Water Zuo	Jul.11, 2014
Checked By	Forrest Lei	Jul.11, 2014
Authorized By	Solger Zhang	Jul.11, 2014

2. PRODUCT INFORMATION

Housing Type: Plastic

EUT Rating Voltage: DC 3.7V by battery

I/O Port Information (☒Applicable ☐Not Applicable)

I/O Port of EUT			
I/O Port Type	**Q'TY**	**Cable**	**Tested with**
USB	1	N/A	1

Note: The product support Bluetooth function and have evaluated with 15.247.please refer to 15.247 report.

3. TEST FACILITY

Facility	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location:	2/F., Building 2, No.1-No.4, Chaxi Sanwei Technical Industrial Park, Gushu, Xixiang, Bao'an District, Shenzhen, Guangdong, China
Description:	The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.4:2003.
Site Filing:	The FCC Registration Number is 259865
Instrument Tolerance:	All measuring equipment is in accord with ANSI C63.4 requirements that meet industry regulatory agency and accreditation agency requirement.

4. SUPPORT EQUIPMENT LIST

Device Type	Manufacturer	Model Name	Serial No.	Data Cable	Power Cable
PC	Dell	INSPIRON	N/A	N/A	1.5m unshielded

5. SYSTEM DESCRIPTION

EUT test procedure:

1. Connect EUT and peripheral devices.
2. Power on the EUT, the EUT begins to work.
3. Running Play music and make sure the EUT normal working.

Test Mode

1. USB (Play music)

NOTE: Other modes have reflected in VOC program.

6 SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§15.107	Conduction Emission	Compliant
§15.109	Radiated Emission	Compliant

7. FCC LINE CONDUCTED EMISSION TEST

7.1. TEST EQUIPMENT OF LINE CONDUCTED EMISSION TEST

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	Agilent	E4440A	US41421290	07/17/2013	07/16/2014
EMI Test Receiver	Rohde & Schwarz	ESCI	100694	07/17/2013	07/16/2014
LISN	Rohde & Schwarz	ESH2-Z5	862060/020	07/17/2013	07/16/2014
Conduction Cable	Sat	CE1	C001	06/04/2014	06/04/2015

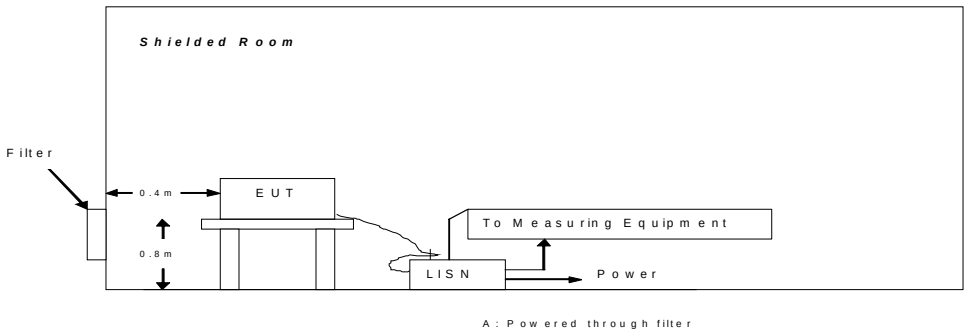
7.2 .LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

**Note: 1. The lower limit shall apply at the transition frequency.

2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz

7.3. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST

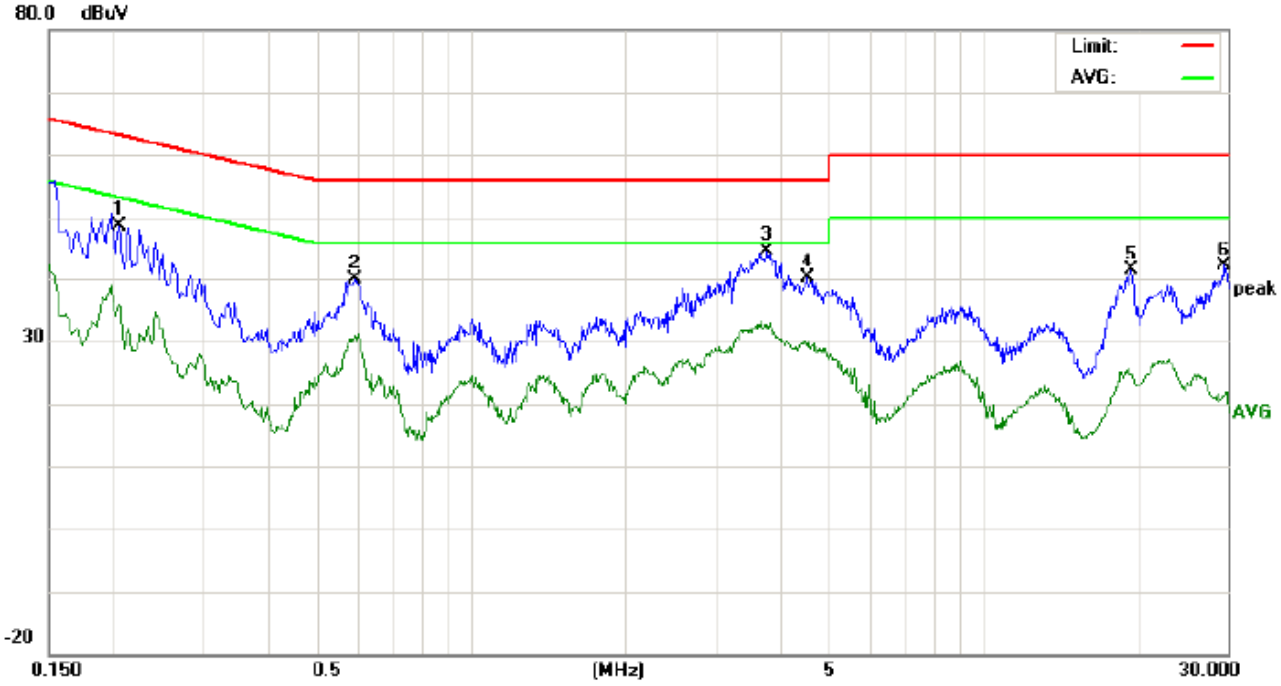


7.4. PROCEDURE OF LINE CONDUCTED EMISSION TEST

1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When 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 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
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) The EUT received DC 5V power by PC. All support equipments received AC 120V/60Hz power from socket under the turntable, if any.
5) 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.
6) Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
7) During the above scans, the emissions were maximized by cable manipulation.
8) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions.
9) Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.

7.5 TEST RESULT OF LINE CONDUCTED EMISSION TEST

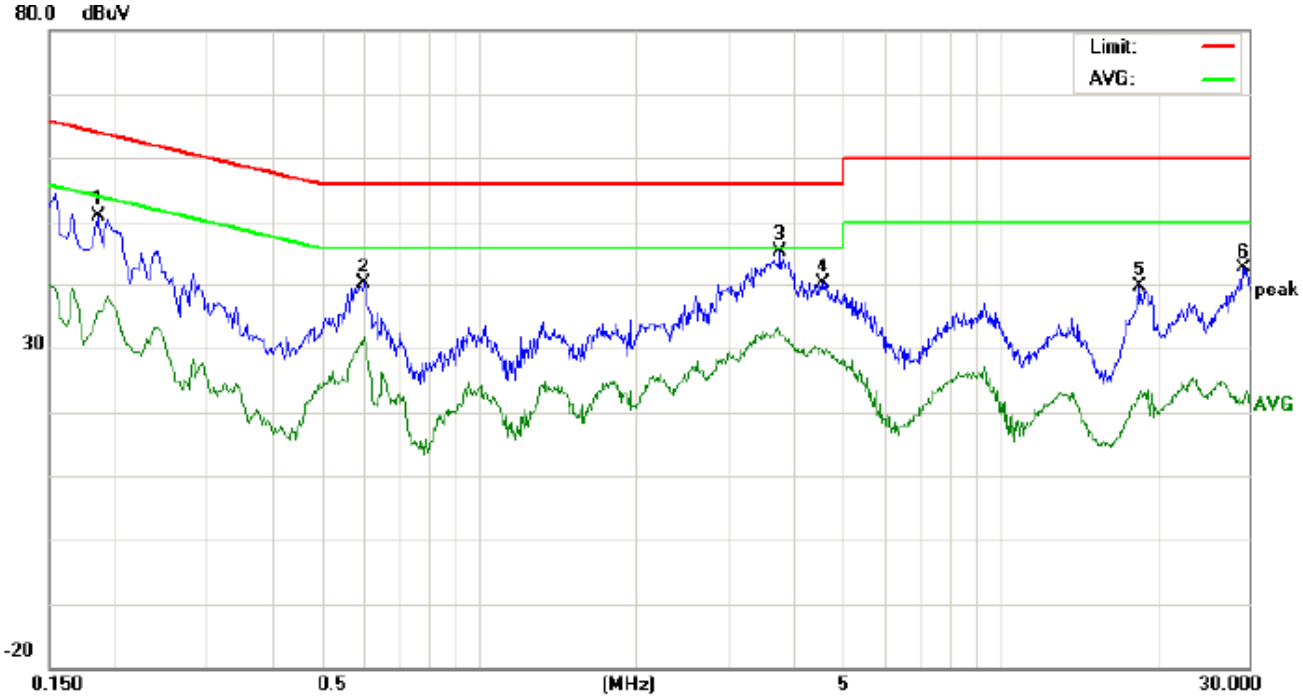
LINE CONDUCTED EMISSION - L



Site: Conduction
Phase: *L1*
Temperature: 26
Limit: FCC Class B Conduction(QP)
Power:
Humidity: 60 %
EUT:Bluetooth headphone
M/N:T1
Mode:Mode1
Note:

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.2060	38.36		25.63	10.22	48.58		35.85	63.36	53.36	-14.78	-17.51	P	
2	0.5940	29.57		20.61	10.32	39.89		30.93	56.00	46.00	-16.11	-15.07	P	
3	3.7900	34.12		21.81	10.46	44.58		32.27	56.00	46.00	-11.42	-13.73	P	
4	4.5460	29.83		19.32	10.21	40.04		29.53	56.00	46.00	-15.96	-16.47	P	
5	19.4700	31.35		14.54	10.12	41.47		24.66	60.00	50.00	-18.53	-25.34	P	
6	29.6500	31.96		10.95	10.12	42.08		21.07	60.00	50.00	-17.92	-28.93	P	

LINE CONDUCTED EMISSION – N



Site: Conduction
Phase: N
Temperature: 26
Limit: FCC Class B Conduction(QP)
Power:
Humidity: 60 %
EUT:Bluetooth headphone
M/N:T1
Mode:Mode1
Note:

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1860	40.65		25.75	10.20	50.85		35.95	64.21	54.21	-13.36	-18.26	P	
2	0.6020	29.89		21.27	10.31	40.20		31.58	56.00	46.00	-15.80	-14.42	P	
3	3.7820	34.86		21.70	10.46	45.32		32.16	56.00	46.00	-10.68	-13.84	P	
4	4.5660	29.91		19.36	10.21	40.12		29.57	56.00	46.00	-15.88	-16.43	P	
5	18.4740	29.46		12.26	10.12	39.58		22.38	60.00	50.00	-20.42	-27.62	P	
6	29.3620	32.45		11.37	10.12	42.57		21.49	60.00	50.00	-17.43	-28.51	P	

8. FCC RADIATED EMISSION TEST

8.1. TEST EQUIPMENT OF RADIATED EMISSION

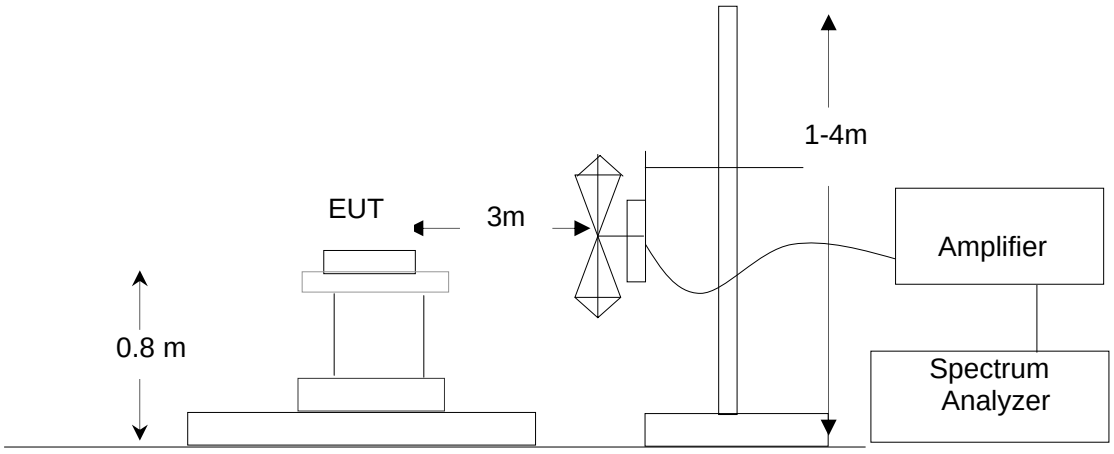
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
PSA SERIES SPECTRUM ANALYZER	AGILENT	E4440A	US41421290	07/17/2013	07/16/2014
ANTENNA	A.H.	SAS-521-4	26	07/17/2013	07/16/2014
HORN ANTENNA	EM	EM-AH-10180	67	04/20/2014	04/19/2015
AMPLIFIER	EM	EM30180	0607030	07/17/2013	07/16/2014
POSITIONING CONTROLLER	MF	MF-7802	MF780208147	07/17/2013	07/16/2014
Radiation Cable 1	Sat	RE1	R003	06/04/2014	06/04/2015
Radiation Cable 2	Sat	RE2	R002	06/04/2014	06/04/2015
Loop Antenna	Daze	ZN30900N	SEL0097	07/16/2014	07/15/2015

8.2. LIMITS OF RADIATED EMISSION TEST

Frequency (MHz)	Distance (m)	Maximum Field Strength Limit (dBuV/m/ Q.P.)
30~88	3	40.0
88~216	3	43.5
216~960	3	46.0
Above 960	3	54.0

**Note: The lower limit shall apply at the transition frequency.

8.3 BLOCK DIAGRAM OF RADIATED EMISSION TEST



8.4 PROCEDURE OF RADIATED EMISSION TEST

1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
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) The EUT received DC 5V by PC. All support equipments received AC 120V/60Hz power from socket under the turntable, if any.
5) The antenna was placed at 3 meter away from the EUT as stated in FCC Part 15. The antenna connected to the Analyzer via a cable and at times a pre-amplifier would be used.
6) The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
7) The test mode(s) were scanned during the test:
8) Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and Q.P./Peak reading is presented.

The test data of the worst case condition(mode 1) was reported on the following Data page

8.5 TEST RESULT OF RADIATED EMISSION TEST

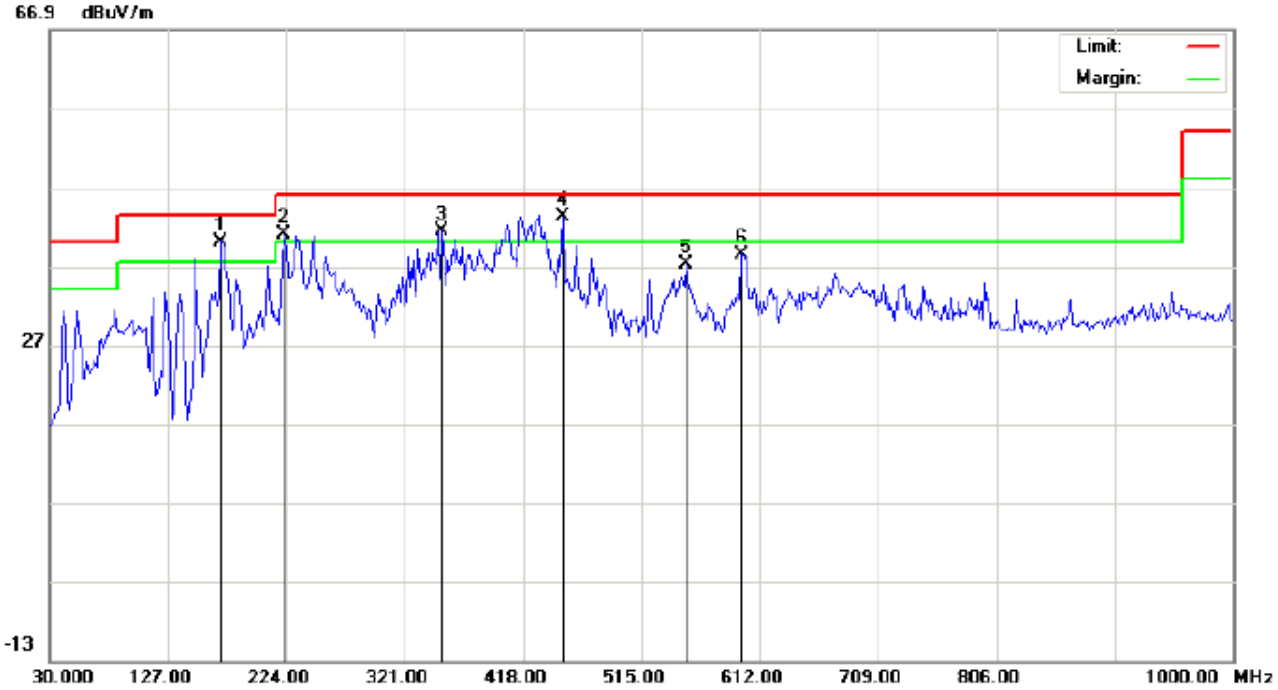
Radiated Emission Below 30 MHz

No emission found between lowest internal used/generated frequencies to 30MHz.

Radiated Emission Above 1GHz

No emission found between 1GHz to 5th harmonic of highest operating frequency.

Radiated Emission Test –Horizontal -3m



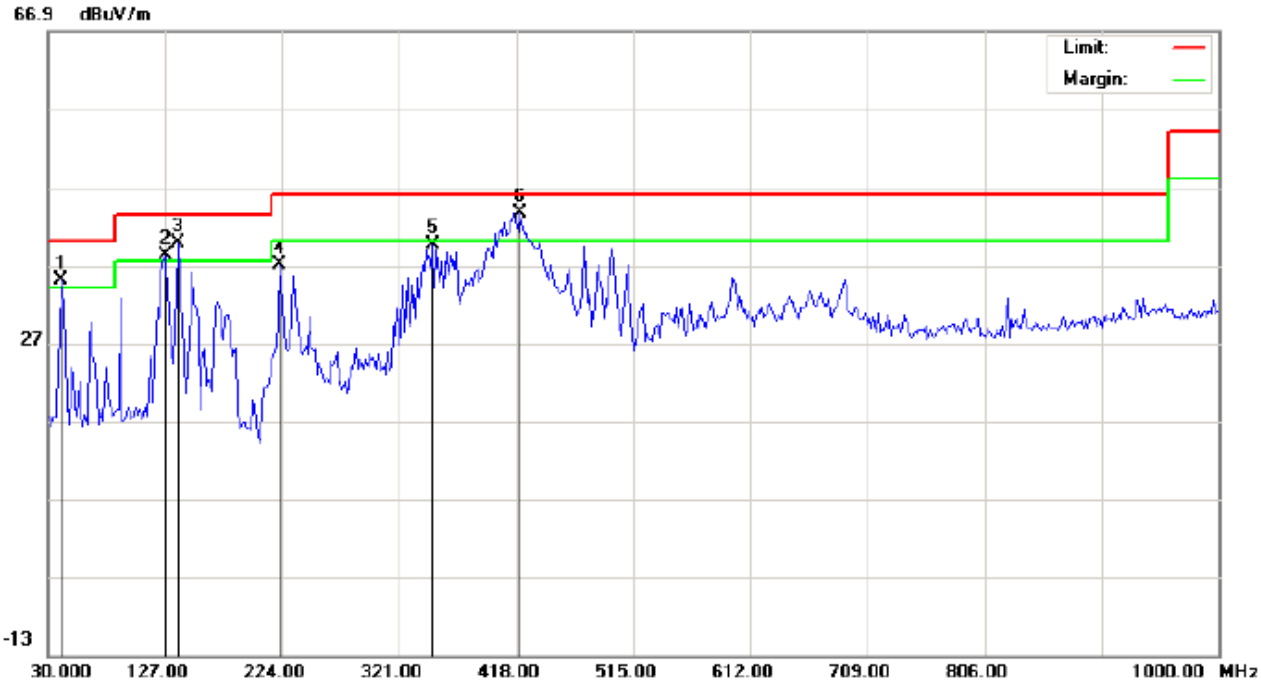
Site: site #1
Limit: FCC Class B 3M Radiation
EUT:Bluetooth headphone
M/N:T1
Mode:Mode1
Note:

Polarization: *Horizontal*
Power:
Distance:

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	!	170.6500	26.85	13.06	39.91	43.50	-3.59	peak			
2	!	222.3833	28.09	12.85	40.94	46.00	-5.06	peak			
3	!	351.7167	22.63	18.75	41.38	46.00	-4.62	peak			
4	*	450.3333	22.59	20.59	43.18	46.00	-2.82	peak			
5		552.1833	14.72	22.53	37.25	46.00	-8.75	peak			
6		597.4500	14.83	23.67	38.50	46.00	-7.50	peak			

Radiated Emission Test –Vertical -3m



Site: site #1
Limit: FCC Class B 3M Radiation
EUT:Bluetooth headphone
M/N:T1
Mode:Mode1
Note:

Polarization: *Vertical*
Power:
Distance:

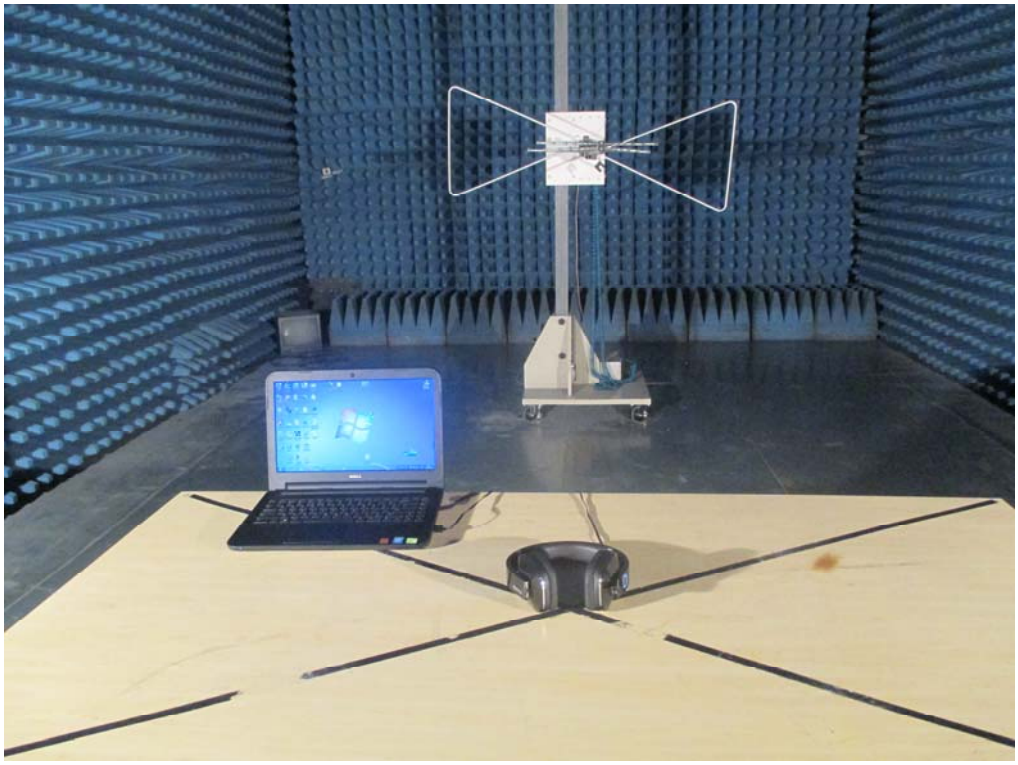
Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	!	41.3167	26.16	8.81	34.97	40.00	-5.03	peak			
2	!	127.0000	28.47	9.78	38.25	43.50	-5.25	peak			
3	!	138.3167	25.27	14.50	39.77	43.50	-3.73	peak			
4		222.3833	25.85	11.19	37.04	46.00	-8.96	peak			
5		348.4833	21.00	18.64	39.64	46.00	-6.36	peak			
6	*	421.2333	23.86	19.72	43.58	46.00	-2.42	peak			

APPENDIX 1
PHOTOGRAPHS OF TEST SETUP

FCC LINE CONDUCTED EMISSION TEST SETUP

FCC RADIATED EMISSION TEST SETUP



APPENDIX 2
PHOTOGRAPHS OF EUT

ALL VIEW OF EUT

TOP VIEW OF EUT

BOTTOM VIEW OF EUT

FRONT VIEW OF EUT

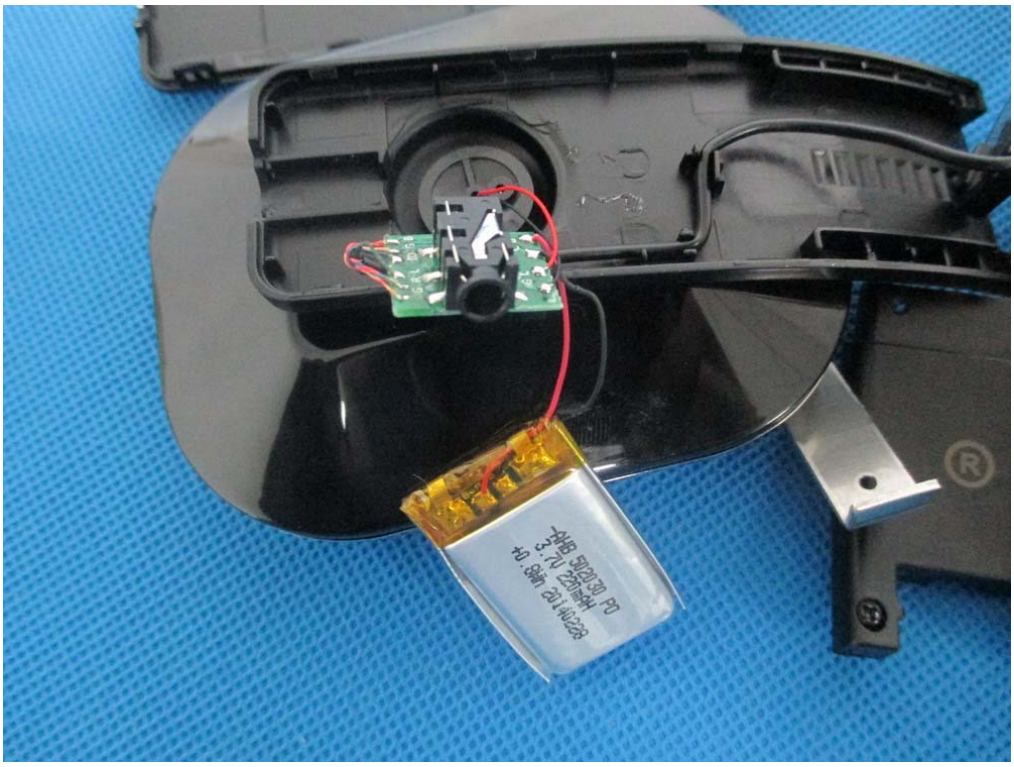
BACK VIEW OF EUT

LEFT VIEW OF EUT

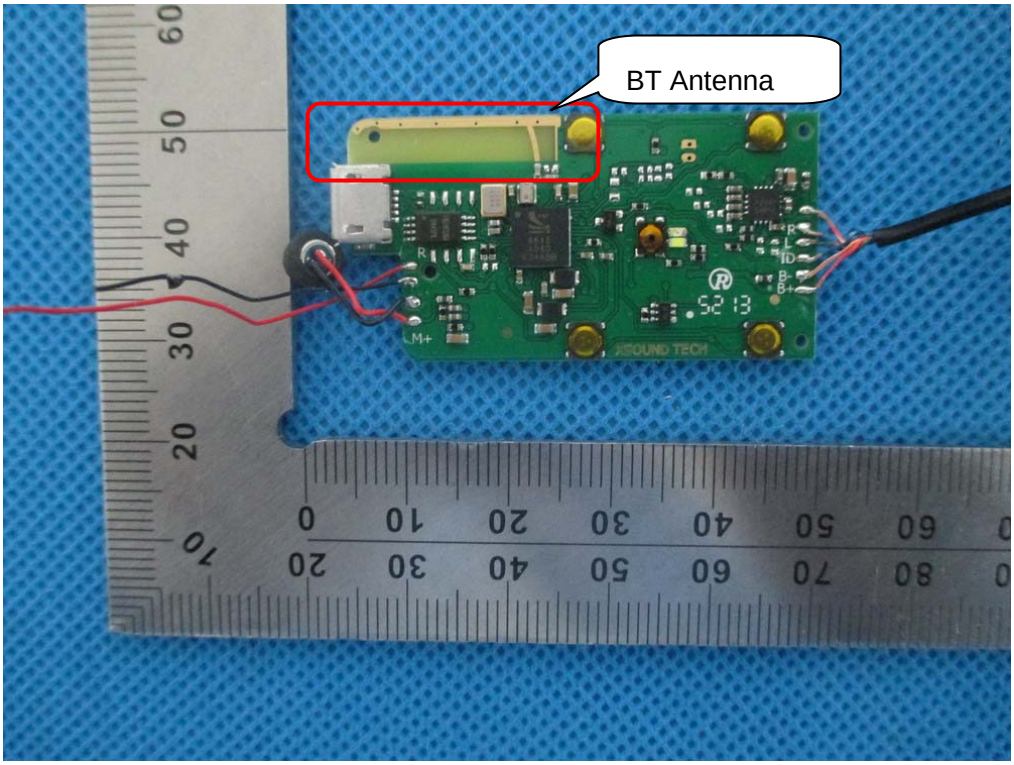
RIGHT VIEW OF EUT

OPEN VIEW OF EUT

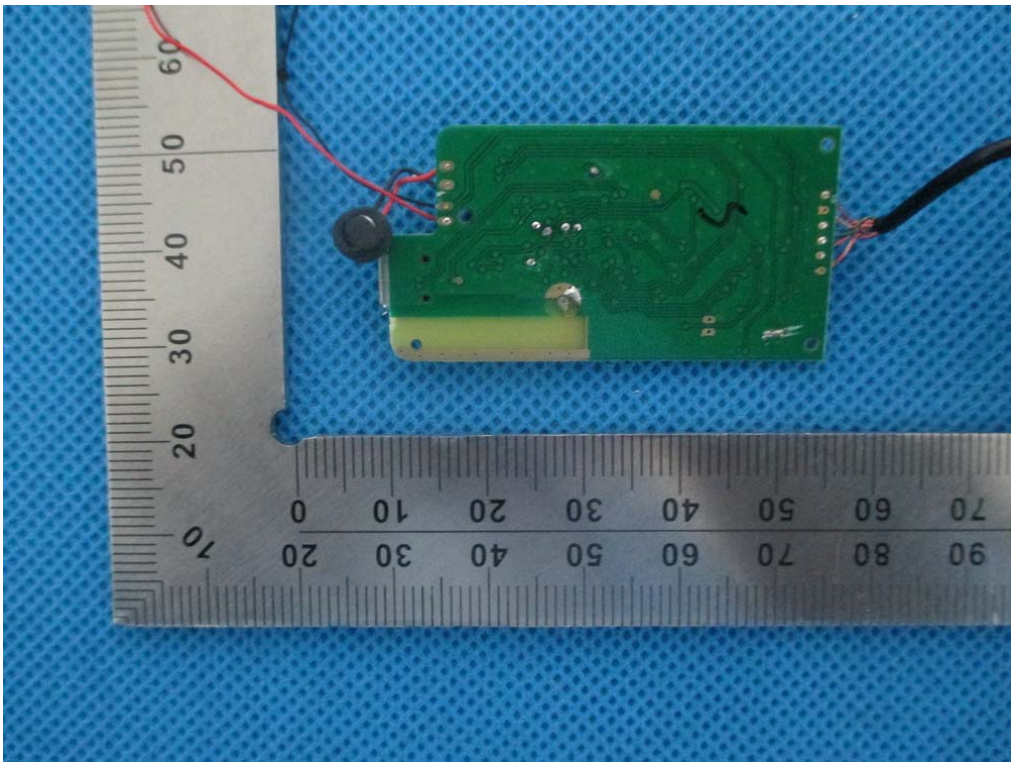
INTERNAL VIEW OF EUT-1



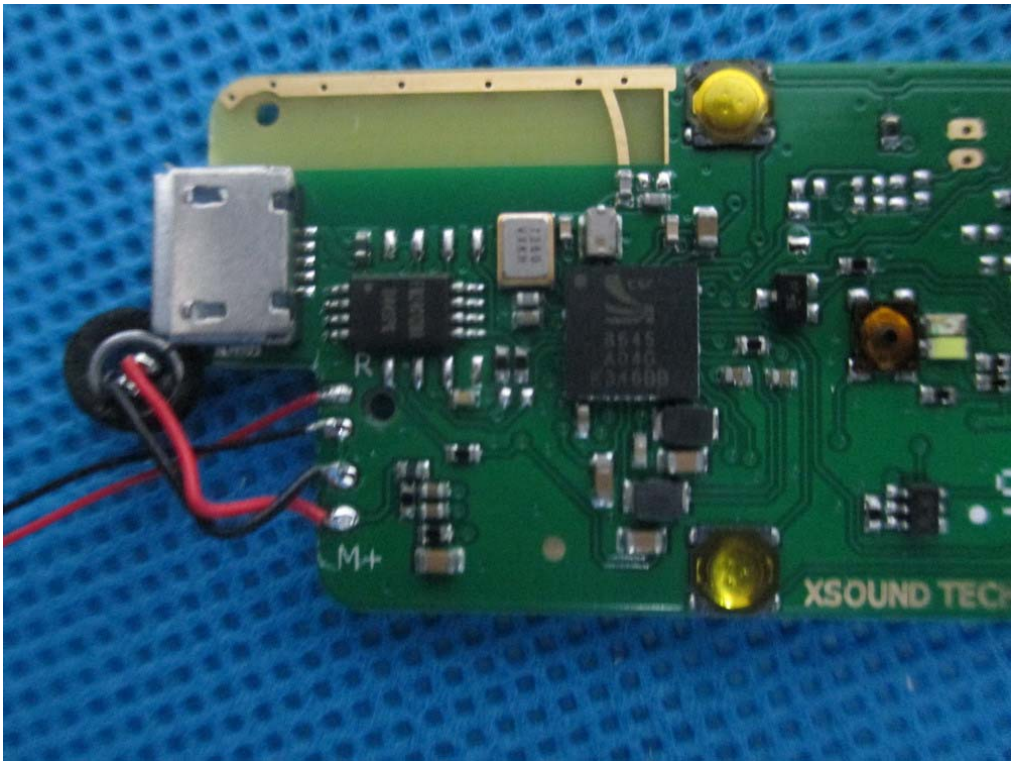
INTERNAL VIEW OF EUT-2



INTERNAL VIEW OF EUT-2



INTERNAL VIEW OF EUT-3



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