Test Report

Applicant:	Adec & Partner AG
Address of Applicant:	Staldenbachstrasse 30 CH-8808, Pfaffikon, Switzerland
Equipment Under Test (EUT):	
EUT Name:	2.4G Wireless Headphone
Model No.:	Swing Digital
Trade Mark:	NA
Serial No.:	Not supplied by client
Standards:	FCC PART15 SUBPART C: 2013
Date of Receipt:	May 21, 2013
Date of Test:	May 22 to Jun. 28, 2013
Date of Issue:	Jun. 30, 2013
Test Result :	**PASS***

* In the configuration tested, the EUT complied with the standards specified above.

Tested by:

Sandy Yu

Sandy Yu / EMC Engineer

Authorized Signature:

Henly

Henly Xie / Manager, Representative of the Lab

This report refers to the General Conditions for Inspection and Testing Services, printed overleaf

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

All test results in this report can be traceable to National or International Standards.

The test report prepare by:

Guangzhou Huesent Testing Service Co.,Ltd.

Self-ordained 68# courtyard, No.91, Dongguanzhuang Road,Guangzhou,China.

Tel: 86-20-28263298 Fax: 86-20-28263237

http://www.hst.org.cn E-mail:hst@hst.org.cn

1 Test Summary

Test	Test Requirement	Test Method	Class / Severity	Result
Radiated Emission (9kHz to 25GHz)	FCC PART 15.249	ANSI C63.4:2003	In FCC PART 15.249	PASS
Occupied Bandwidth	FCC PART 15.215	ANSI C63.4:2003	In FCC PART 15.215	PASS
Conducted Emissions at Mains Terminals	FCC PART 15.207	ANSI C63.10: Clause 6.2 & DA 00-705	In FCC PART 15.207	N/A*

Remark:

♣

Channel	Frequency/ MHz
Lowest	2404.0
Mid	2442.0
Highest	2479.0

The tests were carried out on the 3 samples with the typical frequency listed above.

The tests of occupied bandwidth/ frequency stability/ RF part of radiated emission (test above 1GHz)were carried out for the headphone of headset since the headphone for neck is electric identical with only difference being the power switch and output ports. More details please refer to clauses 4.3 and 7.3 in this report.

N/A*: Not applicable, since the EUT is power supplied only by DC battery.

The wireless microphone system with an associated receiver for transmitting voice. They include a base with an adapter(FCC id: **U94SWING1212**), two headphones (FCC id: **U94SWING1212R**). This report is used for the two headphones.

2 Contents

3 General Information

4.1. Client Information

Applicant:	Adec & Partner AG
Address of Applicant:	Staldenbachstrasse 30 CH-8808, Pfaffikon, Switzerland

4.2. General Description of E.U.T.

EUT Name:	2.4G Wireless Headphone
Item No.:	Swing Digital
Serial No.:	Not supplied by client

4.3. Details of E.U.T.

Power Supply:	3.7VDC Li-polymer rechargeable battery (model: AP12A), 240mAh
Main Function:	Wireless microphone system with an associated receiver for transmitting voice. They include a base, two headphones for and an adapter. And the base has an USB input port. One headphone is called the headset with two earphones. It's built-in touch the power switch, and earphone connecting rod by a switching of power supply. The other we called the neck set without headphones, and it's added a headphone output block and an audio induction coil, a power switch to toggle switch.
Oscillating Frequency:	Headphone's RF module IC (model: CC8520), crystal frequency: 48.0MHz, location: X1.

Frequency Range: 2404.000 MHz to 2479.000 MHz for all the models listed in the cover. 76 channels with 1MHz step for each microphone.

Modulation: 8FSK.

Antenna Type: Fixed; Gained: 2 dBi; Antenna length: 27mm of the headphones.

4.4. Description of Support Units

Test the EUT with the base.

2.4G wireless headphone's base with an adapter. (power supplied: 12Vdc, by AC/DC adapter, model:HS06-1200500US, input: 100-240VAC, 50/60Hz, output: 12.0VDC500mA)

The base FCC id is **U94SWING1212**.

4.5. Standards Applicable for Testing

The standard used was FCC PART 15, SUBPART C, PART 15.249.

The EUT belongs to low power communication device transmitter, and it's an unlicensed low power auxiliary device.

4.6. Test Location

GuangZhou Huesent Testing Service Co., Ltd.

No.91, Dongguanzhuang Road, Guangzhou, China.

Tel: 86-20-87221905, Fax: 86-20-87223892

CNAS- Accreditation No.: L2885.

CMA- Authorisation Certificate No.: 2008191614Z

ERP & Spurious Emission tests were subcontracted to the laboratory following-

Guangdong Environment Radiation Monitoring Center.

860, South Guangzhou Avenue, Guangzhou, P.R. China

Tel: 86-20-84281721 Fax: N/A Email: Kevin.ma@nemko.com

FCC- Registration No: 667318 on on Sep. 29, 2009
CNAS- Accreditation No: L5539.

4.7. Deviation from Standards

None.

4.8. Abnormalities from Standard Conditions

None.

5. Equipments Used during Test

Test Equipment	Manufactory	Model No.	Serial No. Equipment No.	Cal Date	Cal Due to Dat
3m Semi-anechoic Chamber	Albatross Projecets Gm	SAC-3M	/ 1.001	2012-10-9	2014-10-9
Spectrum Analyzer	R&S	FSP30	101230 1.003	2012-7-30	2013-7-30
Spectrum Analyzer	R&S	FSP30	100207 EMC0001	2013-3-30	2014-3-30
EMI Receiver	R & S	ESCI	100849 1.002	2012-7-30	2013-7-30
EMI Receiver	R & S	ESCI	100336 EMC1002	2013-3-4	2014-3-4
LISN	AFJ	LS16C	16010643209 EMC1003	2013-2-28	2014-2-28
Two-Line V-Network	R & S	ENV216	100101 1.004	2012-7-30	2013-7-30
Shielding Room	DG ZongZhou	ZW-391 7x3.9x3 m	/ EMC1001	2011-5-25	2014-5-25
RF Signal Generator	R & S	SMB100A-B106	118622 1.031	2013-3-22	2014-3-22
Anechoic Chamber	ETS•Lindgren	RFSD-F-100	/ ITL-100	2012-4-10	2014-4-10
Power Meter	R & S	NRP2	101859 1.033	2013-3-22	2014-3-22
RF Power Amplifier	BONN	BLWA 0830-160/100/ 60D	118622 1.032	2013-3-22	2014-3-22
18G RF Pre-amplifier	MITEQ	AFS44	1381096 1.01.1	2013-6-8	2014-6-8
Power Meter	Rohde & Schwarz	URV35	100193 EMC1506	2013-6-8	2014-6-8
Audio Analyzer	Hewlett Packard	8903B	0467331 EMC0011	2013-2-27	2014-2-27
Power Sensor	Rohde & Schwarz	URV5-Z7	100287 EMC1507	2013-6-8	2014-6-8
Temperature Chamber	Gongwen	GDS-250	1150 SFT0009	2013-6-8	2014-6-8
D.C. Power Supply	Wellstar	PS-205A	/ SEL0045	2013-6-8	2014-6-8

Humidity/ Temperature Meter	Shanghai	ZJ1-2B	/ SEL0101 to SEL0103	2013-6-8	2014-6-8
Barometer	ChangChun	DYM3	/ SEL0088	2013-6-8	2014-6-8
Digital Multimeter	Victor	VC9805A+	992336119 EMC0017	2013-6-8	2014-6-8
DC Power Supply	DG HuaYang	PS-3030	9862036 SFT0010	2013-6-8	2014-6-8
Low Loss Coaxial Cable	HST	2 m	/ EMC1008	2012-12-6	2013-12-6
Noise Generator	Ningbo Zhongce	DF1681	6006867 EMC0009	2013-5-30	2014-5-30
Monopole Antenna	HST	N/A	EMC6002	2013-6-8	2014-6-8
1G-18GHz Double Ridged Guide Antenna	R & S	HF906	100685 1.01	2013-5-22	2014-5-22
15G-26.5(40)GHz Double Ridged Guide Antenna	Schwarzbeck	BBHA 9170	/ EMC7001	2013-6-8	2014-6-8
9k-30MHz Loop Antenna	BJ 2nd Factory	ZN30900A	B2-005; EMC6001	2012-9-24	2013-9-24
Biconilog Antenna	Schwarzbeck	VULB9163	9163-378 1.011	2013-5-22	2015-5-22

6. Test Results

6.1. RADIATION INTERFERENCE

Test Requirement: FCC Part15.249, a) & FCC Part15.209

Test Method: ANSI C63.4:2003

Detector: Peak for pre-scan (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.)
Average detector if maximised peak within 6dB of limit

Test Date: Jun. 3, 2013

6.1.1 E.U.T. Operation

Operating Environment:

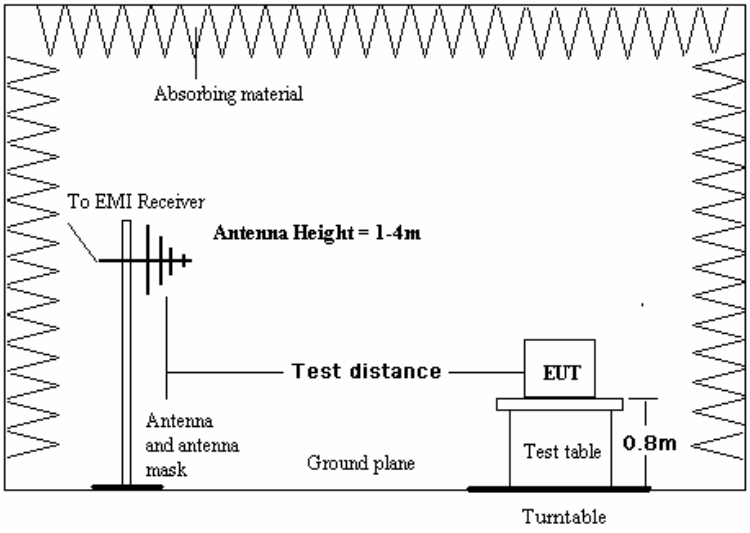
Temperature: 25°C Humidity:45% RH Atmospheric Pressure: 1020mBar

EUT Operation:

In the fundamental test, connecting the EUT to peripheral devices (the base).

Test the EUT work normally in on mode during the whole test.

6.1.2 Test Setup



6.1.3 Test Procedure

ANSI STANDARD C63.4-2003 10.1.7 MEASUREMENT PROCEDURES:

An initial pre-scan was performed in the 3m chamber using the spectrum analyser in peak detection mode. Average measurements were conducted based on the peak sweep graph. 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 polarities.

6.1.4 Measurement Data

Copy from FCC Part 15.249.a)

(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental	Field Strength	
Frequency	Fundamental	Harmonics
MHz	millivolts/meter(mV/m)	microvolts/meter(uV/m)
902 - 928	50	500
2400 - 2483.5	50	500
5725 - 5875	50	500
24000 - 24250	250	2500

Peak measurement of carrier

Frequency	Level		Transducer	Limit	Margin	
MHz	dBuV/m		dB	dBuV/m	dB	
	V	H			V	H
2404.0 (L)	82.2	86.5	-13.8	114	31.8	27.5
2442.0 (M)	82.1	86.3	-11.9		31.9	27.7
2479.0 (H)	82.0	86.1	-10.6		32.0	27.9
Note: 50mV/m (94dBuV/m) for AVG limit, and Peak limit= AVG limit + 20dB.						

Average measurement of carrier

Frequency	Level		Transducer	Limit	Margin	
MHz	dBuV/m		dB	dBuV/m	dB	
	V	H			V	H
2404.0 (L)	58.3	64.3	-13.8	94	35.7	29.7
2442.0 (M)	58.5	64.5	-11.9		35.5	29.5
2479.0 (H)	58.7	64.8	-10.6		35.3	29.2

Note:

50mV/m (94dBuV/m) for AVG limit, and Peak limit= AVG limit + 20dB.

The transducer factor = antenna factor + cable loss - preamplifier.

The Level = Read level + transducer factor.

H: Antenna polarization horizontal direction. V: Antenna polarization vertical direction.

Peak measurement of harmonics and spurious emission at lowest channel 2404MHz

Frequency		Level		Transducer	Limit	Min. Margin	
MHz		dBuV/m		dB	dBuV/m	dB	
		V	H			V	H
2nd	4808.0	40.2	40.3	-11.8	74dB	33.8	33.7
3rd	7212.0	43.2	43.5	-7.9		30.8	30.5
4th	9616.0	43.5	44.2	-4.6		30.5	29.8
5th	12020.0	43.6	44.1	-3.6		30.4	29.9
6th	14424.0	44.1	44.5	-2.0		29.9	29.5
7th	16828.0	44.2	44.5	-0.7		29.8	29.5
8th	19232.0	44.0	44.8	-1.0		30.0	29.2
9th	21636.0	44.6	45.2	-0.8		29.4	28.8
10th	24040.0	44.7	45.3	-0.6		29.3	28.7

Average measurement of harmonics and spurious emission at lowest channel 2404MHz

Frequency		Level		Transducer	Limit	Min. Margin	
MHz		dBuV/m		dB	dBuV/m	dB	
		V	H			V	H
2nd	4808.0	32.2	33.3	-11.8	54dB	21.8	20.7
3rd	7212.0	31.2	33.2	-7.9		22.8	20.8
4th	9616.0	32.3	34.2	-4.6		21.7	19.8
5th	12020.0	33.3	34.3	-3.6		20.7	19.7
6th	14424.0	33.1	34.7	-2.0		20.9	19.3
7th	16828.0	34.0	34.4	-0.7		20.0	19.6
8th	19232.0	34.2	34.8	-1.0		19.8	19.2
9th	21636.0	34.5	35.2	-0.8		19.5	18.8
10th	24040.0	34.7	35.8	-0.6		19.3	18.2

Note:

500μV/m (54dBuV/m) for AVG limit, and Peak limit= AVG limit + 20dB.

The transducer factor = antenna factor + cable loss - preamplifier.

The Level = Read level + transducer factor.

H: Antenna polarization horizontal direction. V: Antenna polarization vertical direction.

Peak measurement of harmonics and spurious emission at middle channel 2442MHz

Frequency		Level		Transducer	Limit	Min. Margin	
MHz		dBuV/m		dB	dBuV/m	dB	
		V	H			V	H
2nd	4884.0	40.1	40.2	-11.8	74dB	33.9	33.8
3rd	7326.0	43.3	43.4	-7.9		30.7	30.6
4th	9768.0	43.3	43.7	-4.6		30.7	30.3
5th	12210.0	43.5	44.2	-3.6		30.5	29.8
6th	14652.0	43.8	44.7	-2.0		30.2	29.3
7th	17094.0	44.4	44.2	-0.7		29.6	29.8
8th	19536.0	44.1	44.5	-1.0		29.9	29.5
9th	21978.0	44.2	45.6	-0.8		29.8	28.4
10th	24420.0	44.7	45.4	-0.6		29.3	28.6

Average measurement of harmonics and spurious emission at middle channel 2442MHz

Frequency		Level		Transducer	Limit	Min. Margin	
MHz		dBuV/m		dB	dBuV/m	dB	
		V	H			V	H
2nd	4884.0	32.3	33.4	-11.8	54dB	21.7	20.6
3rd	7326.0	31.6	33.5	-7.9		22.4	20.5
4th	9768.0	32.2	34.7	-4.6		21.8	19.3
5th	12210.0	33.2	34.4	-3.6		20.8	19.6
6th	14652.0	33.5	34.6	-2.0		20.5	19.4
7th	17094.0	34.1	34.2	-0.7		19.9	19.8
8th	19536.0	34.3	34.8	-1.0		19.7	19.2
9th	21978.0	34.5	35.8	-0.8		19.5	18.2
10th	24420.0	34.6	35.9	-0.6		19.4	18.1

Note:

500μV/m (54dBuV/m) for AVG limit, and Peak limit= AVG limit + 20dB.

The transducer factor = antenna factor + cable loss - preamplifier.

The Level = Read level + transducer factor.

H: Antenna polarization horizontal direction. V: Antenna polarization vertical direction.

Peak measurement of harmonics and spurious emission at highest channel 2479MHz

Frequency		Level		Transducer	Limit	Min. Margin	
MHz		dBuV/m		dB	dBuV/m	dB	
		V	H			V	H
2nd	4958.0	40.6	40.5	-11.8	74dB	33.4	33.5
3rd	7437.0	43.1	43.7	-7.9		30.9	30.3
4th	9916.0	43.4	44.8	-4.6		30.6	29.2
5th	12395.0	43.2	44.8	-3.6		30.8	29.2
6th	14874.0	44.3	44.7	-2.0		29.7	29.3
7th	17353.0	44.4	44.7	-0.7		29.6	29.3
8th	19832.0	44.1	44.6	-1.0		29.9	29.4
9th	22311.0	44.2	45.1	-0.8		29.8	28.9
10th	24790.0	44.7	45.8	-0.6		29.3	28.2

Average measurement of harmonics and spurious emission at highest channel 2479MHz

Frequency		Level		Transducer	Limit	Min. Margin	
MHz		dBuV/m		dB	dBuV/m	dB	
		V	H			V	H
2nd	4958.0	32.3	33.6	-11.8	54dB	21.7	20.4
3rd	7437.0	31.1	33.6	-7.9		22.9	20.4
4th	9916.0	32.3	34.2	-4.6		21.7	19.8
5th	12395.0	33.3	34.6	-3.6		20.7	19.4
6th	14874.0	33.2	34.9	-2.0		20.8	19.1
7th	17353.0	34.1	34.6	-0.7		19.9	19.4
8th	19832.0	34.3	34.7	-1.0		19.7	19.3
9th	22311.0	34.4	35.7	-0.8		19.6	18.3
10th	24790.0	34.8	35.6	-0.6		19.2	18.4

Note:

500μV/m (54dBuV/m) for AVG limit, and Peak limit= AVG limit + 20dB.

The transducer factor = antenna factor + cable loss - preamplifier.

The Level = Read level + transducer factor.

H: Antenna polarization horizontal direction. V: Antenna polarization vertical direction.

Note:

The EUT's transmitting frequency range is 2404-2479MHz, and it is complied with the requirements of FCC Part 15.249.a).

6.1.5 Radiated outside of the specified frequency bands

Copy from FCC Part 15.249.d)

(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 Section 15.209, whichever is the lesser attenuation.

Copy from FCC Part 15.209: Radiated emission limits, general requirements

(a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency	Field Strength	Measurement Distance
MHz	microvolts/meter(uV/m)	(meters)
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

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

(d) The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

Note:

Since the fundamental emissions peak and average values are shown on section 6.1.4 of this report, the general radiated emission limits in Section 15.209 is the lesser attenuation.

Limits for the frequency bands of 2400 M - 2483.5 MHz

Frequency	15.209 General Radiated limits	
MHz	dBuV/m@3m	
	QP	AVG
30 - 88	40	/
88 - 216	43.5	/
216 - 960	46	/
960 - 1000	54	/
Above 1000	74(PK)	54

Frequency	15.249.d) limits	
MHz	dBuV/m@3m	
	QP	AVG
30 - 88	40	/
88 - 216	43.5	/
216 - 960	46	/
960 - 1000	54	/
1000-2400, 2483.5-25000 & except for harmonics	74(PK)	54

Remark:
1. RF line voltage (dBuV)= 20 log RF line voltage (uV)
2. In the above table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

6.1.6 Measurement Data for 15.249.d

1) 9kHz~30MHz Test result

Test the two headphones for head and for neck

The Low frequency, which started from 9kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not report.

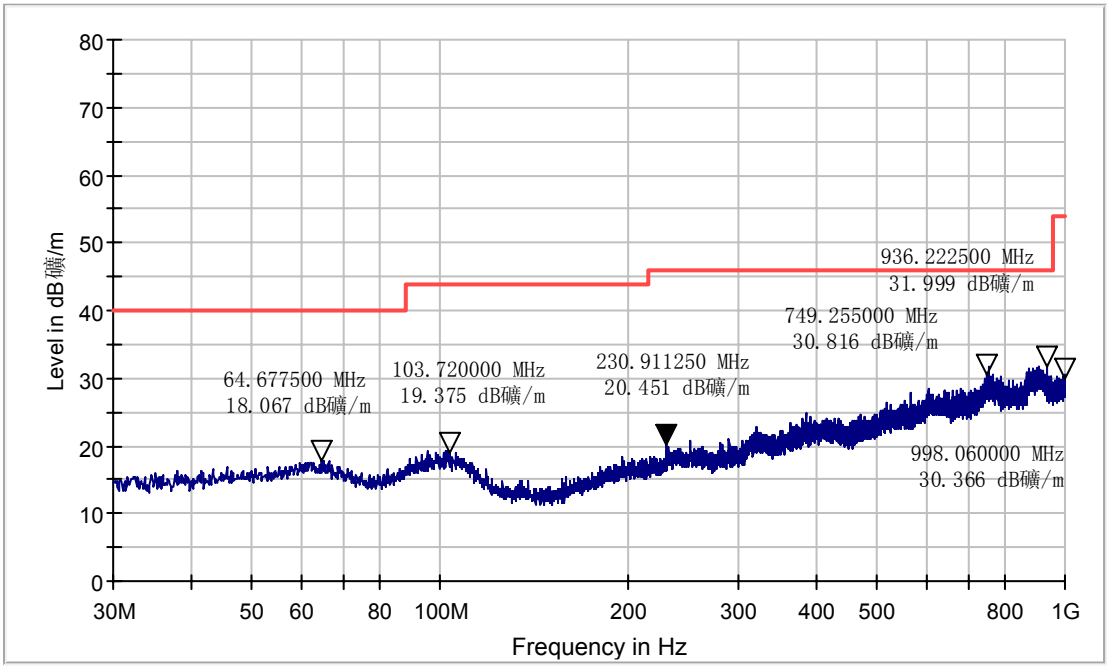
2) 30 MHz~1 GHz Spurious Emissions. Quasi-Peak Measurement

Test curves (with the Quasi-peak measurement and QP limit), 30M-1GHz, Horizontal & Vertical:

2.1) Test the headphone for head

1#: lowest channel 2404MHz, Horizontal

FCC PART15 Rad. EM VULB9163 PRE



Quasi-peak measurement

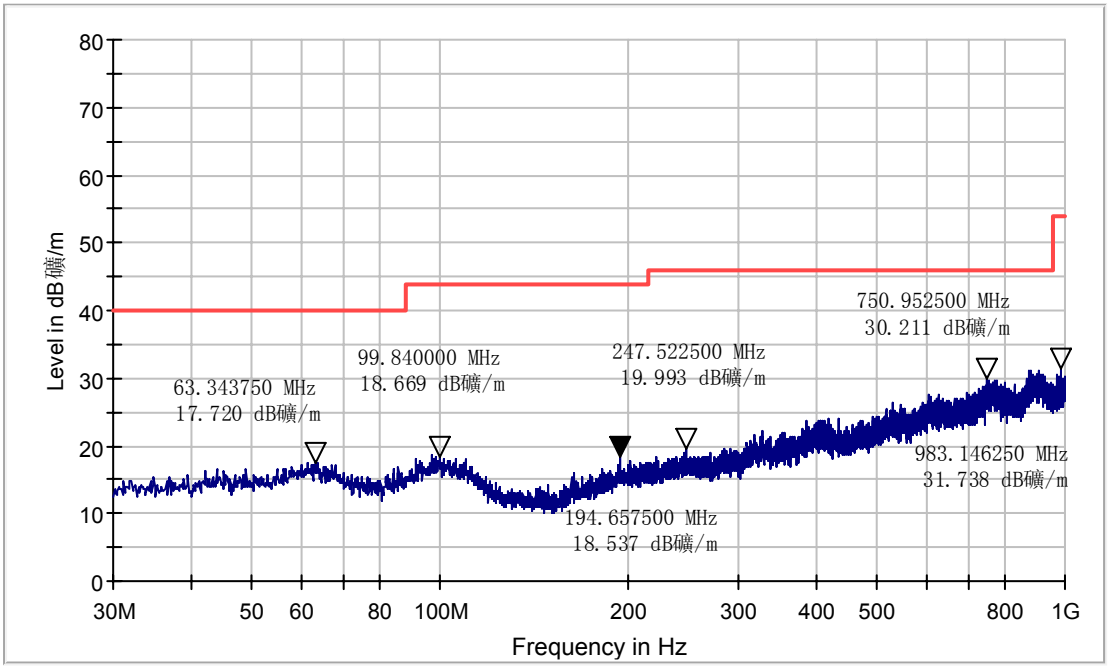
Frequency	Level	Transducer	Limit	Margin
MHz	dBuV/m	dB	dBuV/m	dB
64.7	18.1	12.3	40	21.9
103.7	19.4	12.4	43.5	24.1
230.9	20.5	12.6	46	25.5
749.3	30.8	16.1	46	15.2
936.2	32.0	14.8	46	14.0
998.1	30.4	14.4	54	23.6

Note:

The transducer factor includes antenna factor and cable loss.

1#: lowest channel 2404MHz, Vertical

FCC PART15 Rad. EM VULB9163 PRE



Quasi-peak measurement

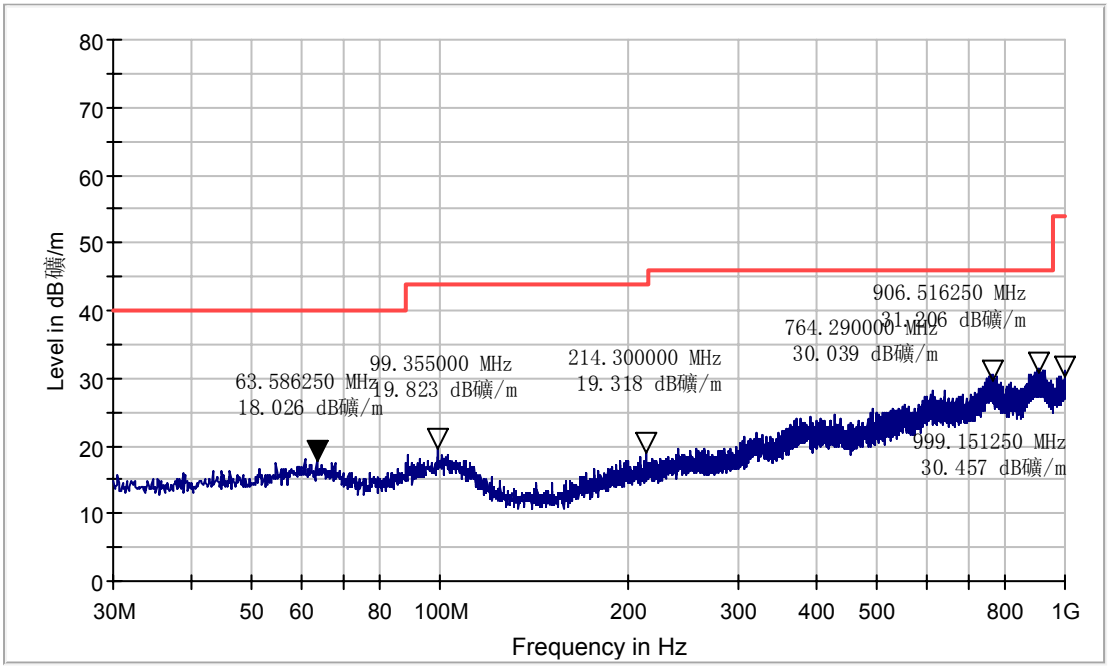
Frequency	Level	Transducer	Limit	Margin
MHz	dBuV/m	dB	dBuV/m	dB
63.3	17.7	12.3	40	22.3
99.8	18.7	12.4	43.5	24.8
194.7	18.5	12.6	43.5	25.0
247.5	20.0	12.7	46	26.0
751.0	30.2	14.5	46	15.8
983.1	31.7	14.5	54	22.3

Note:

The transducer factor includes antenna factor and cable loss.

2#: middle channel 2442MHz, Horizontal

FCC PART15 Rad. EM VULB9163 PRE



Quasi-peak measurement

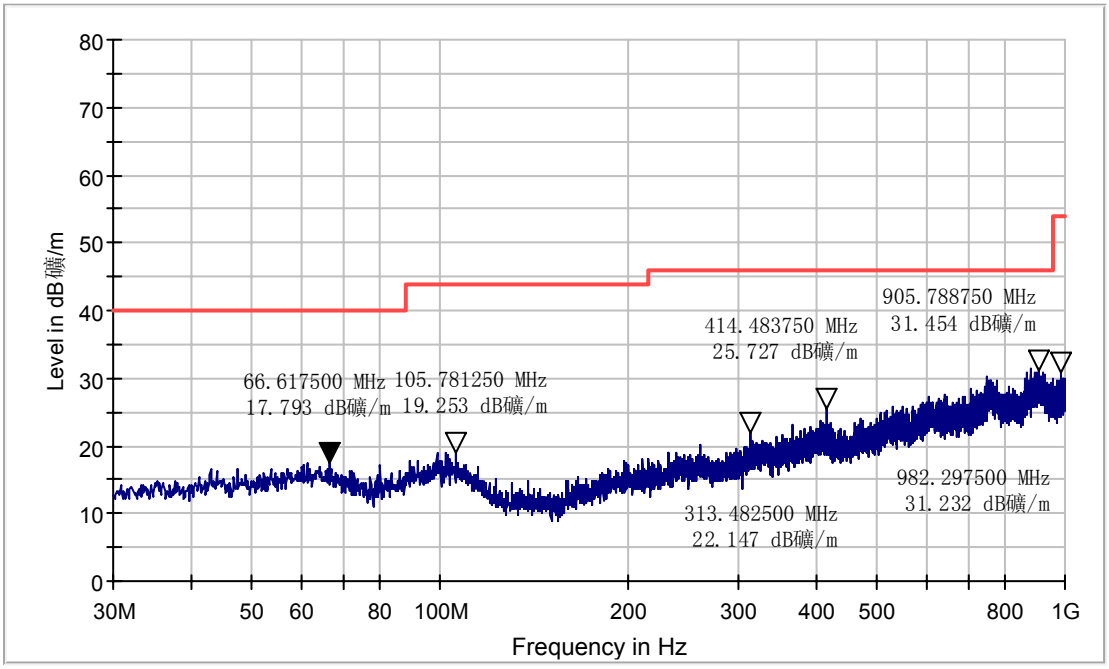
Frequency	Level	Transducer	Limit	Margin
MHz	dBuV/m	dB	dBuV/m	dB
63.6	18.0	12.3	40	22.0
99.4	19.8	12.4	43.5	23.7
214.3	19.4	12.6	43.5	24.1
764.3	30.0	14.4	46	16.0
906.5	31.3	14.5	46	14.7
999.2	30.5	14.6	54	23.5

Note:

The transducer factor includes antenna factor and cable loss.

2#: middle channel 2442MHz, Vertical

FCC PART15 Rad. EM VULB9163 PRE



Quasi-peak measurement

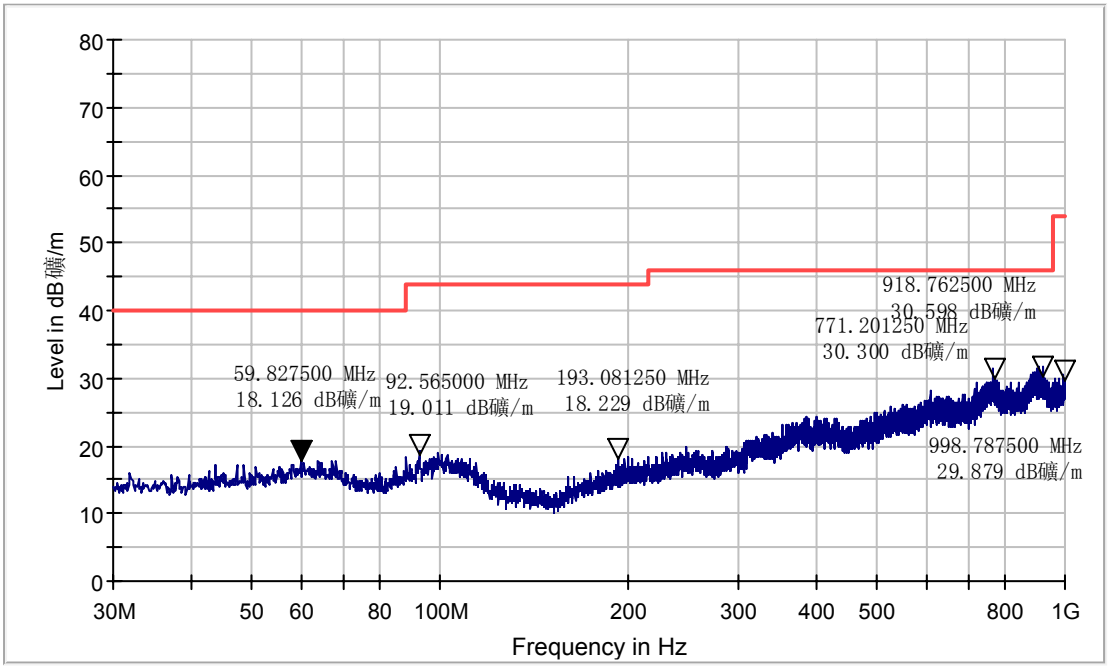
Frequency	Level	Transducer	Limit	Margin
MHz	dBuV/m	dB	dBuV/m	dB
66.6	17.8	12.3	40	22.2
105.8	19.3	12.4	43.5	24.2
313.5	22.1	13.1	46	23.9
414.5	25.7	15.3	46	20.3
905.8	31.5	14.9	46	14.5
982.3	31.2	14.5	54	22.8

Note:

The transducer factor includes antenna factor and cable loss.

3#: highest channel 2479MHz, Horizontal

FCC PART15 Rad. EM VULB9163 PRE



Quasi-peak measurement

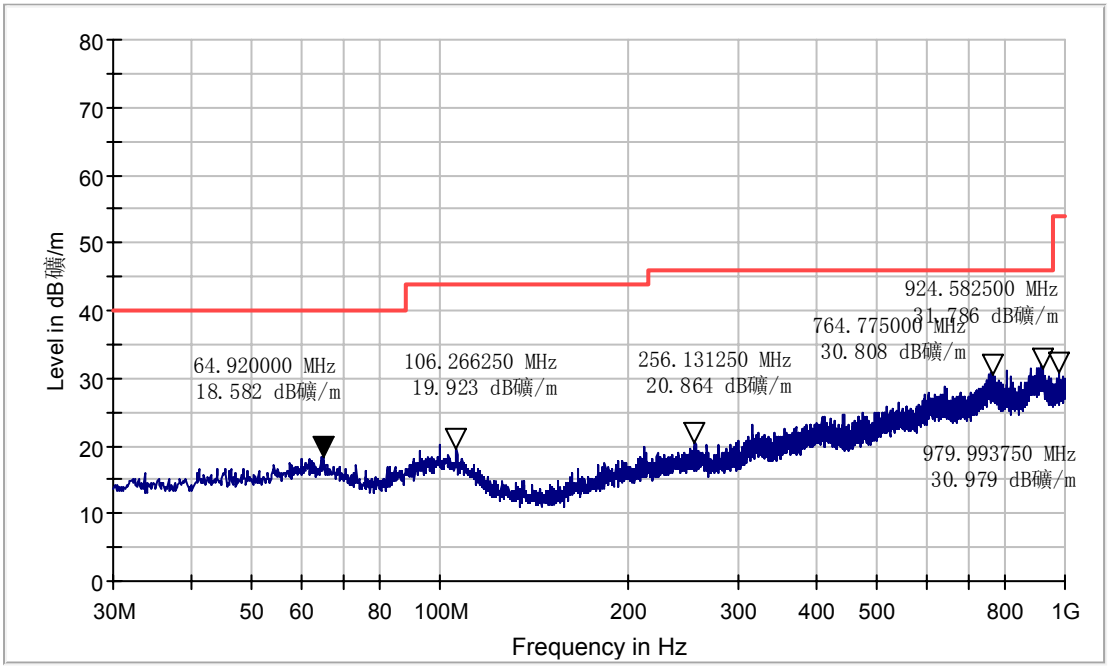
Frequency	Level	Transducer	Limit	Margin
MHz	dBuV/m	dB	dBuV/m	dB
59.8	18.1	12.5	40	21.9
92.6	19.0	12.4	43.5	24.5
193.1	18.2	12.6	43.5	25.3
771.2	30.3	14.4	46	15.7
918.8	30.6	14.9	46	15.4
998.8	29.9	14.6	54	24.1

Note:

The transducer factor includes antenna factor and cable loss.

3#: highest channel 2479MHz, Vertical

FCC PART15 Rad. EM VULB9163 PRE



Quasi-peak measurement

Frequency	Level	Transducer	Limit	Margin
MHz	dBuV/m	dB	dBuV/m	dB
64.9	18.6	12.3	40	21.4
106.3	19.9	12.4	43.5	23.6
256.1	20.9	12.8	46	25.1
764.8	30.8	14.4	46	15.2
924.6	31.8	15.0	46	14.2
980.0	31.0	14.5	54	23.0

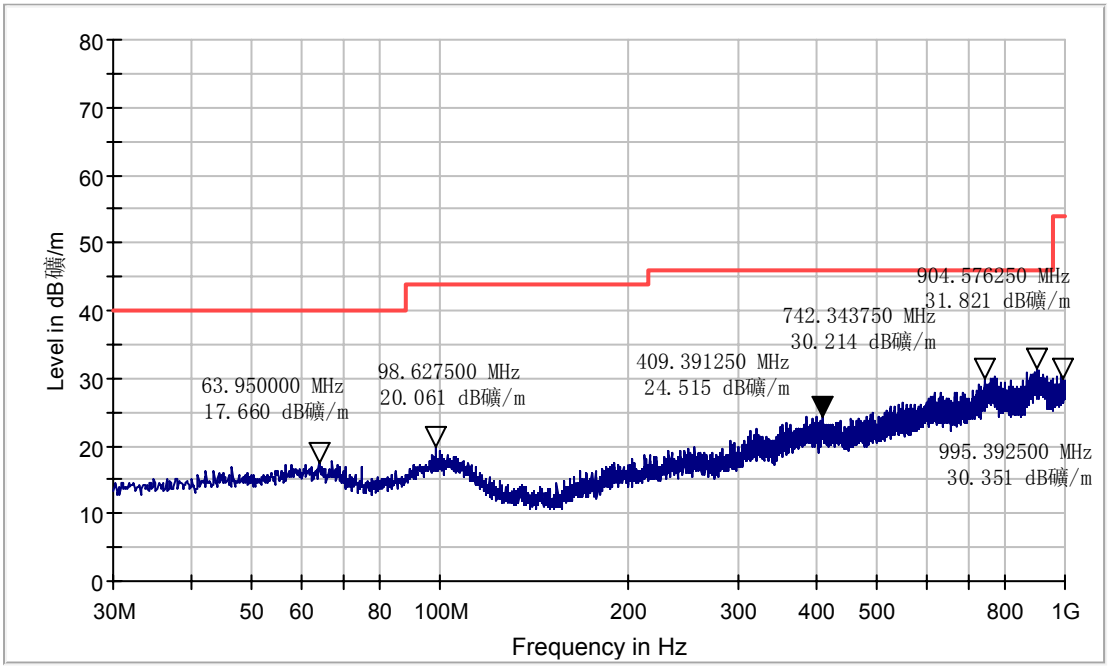
Note:

The transducer factor includes antenna factor and cable loss.

2.2) Test the headphone for neck

4#: lowest channel 2404MHz, Horizontal

FCC PART15 Rad. EM VULB9163 PRE



Quasi-peak measurement

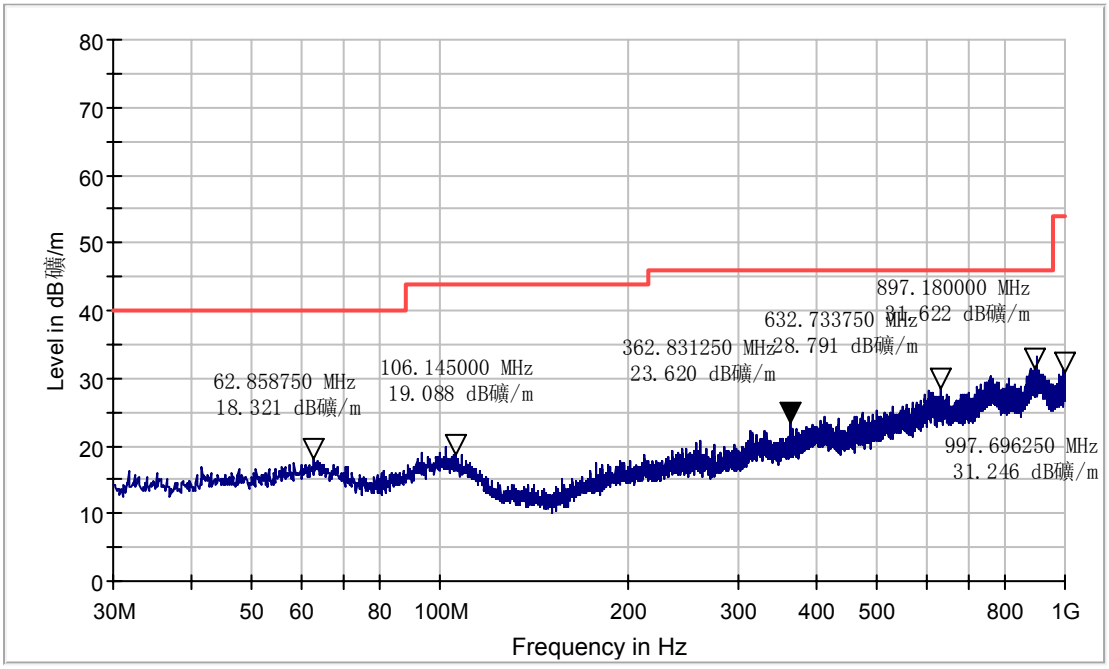
Frequency	Level	Transducer	Limit	Margin
MHz	dBuV/m	dB	dBuV/m	dB
64.0	17.7	12.3	40	22.3
98.6	20.1	12.4	43.5	23.4
409.4	24.5	18.4	46	21.5
742.3	30.2	14.4	46	15.8
904.6	31.8	15.0	46	14.2
995.4	30.4	14.4	54	23.6

Note:

The transducer factor includes antenna factor and cable loss.

4#: lowest channel 2404MHz, Vertical

FCC PART15 Rad. EM VULB9163 PRE



Quasi-peak measurement

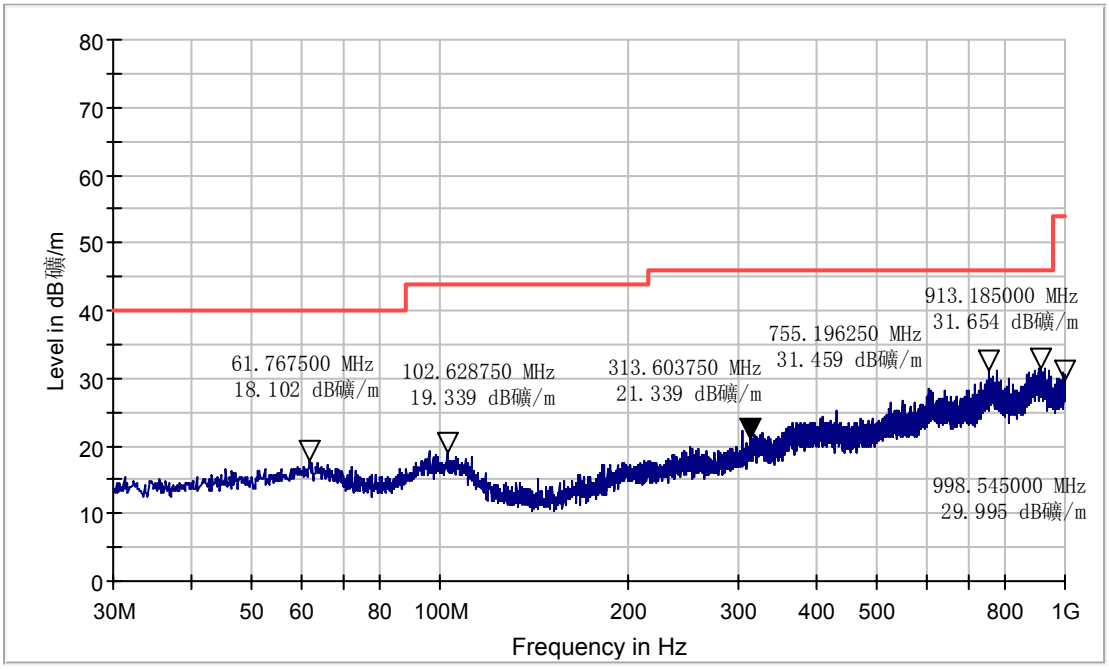
Frequency	Level	Transducer	Limit	Margin
MHz	dBuV/m	dB	dBuV/m	dB
62.9	18.3	12.3	40	21.7
106.1	19.1	12.4	43.5	24.4
362.8	23.6	18.6	46	22.4
632.7	23.8	17.1	46	22.2
897.2	32.6	15.0	46	13.4
997.7	31.2	14.4	54	22.8

Note:

The transducer factor includes antenna factor and cable loss.

5#: middle channel 2442MHz, Horizontal

FCC PART15 Rad. EM VULB9163 PRE



Quasi-peak measurement

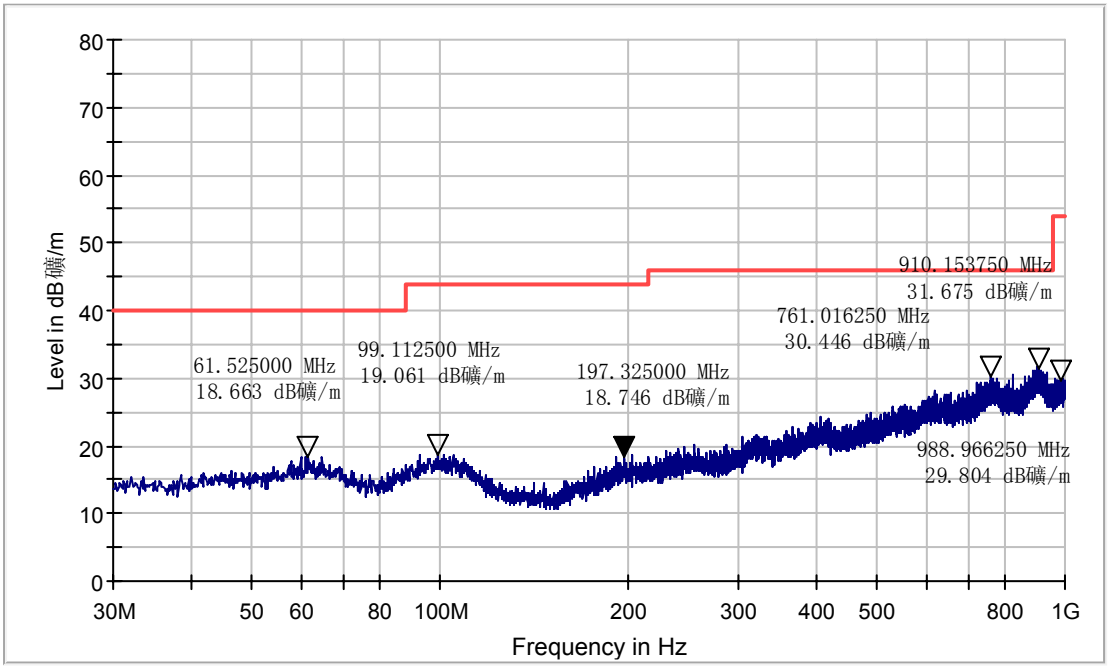
Frequency	Level	Transducer	Limit	Margin
MHz	dBuV/m	dB	dBuV/m	dB
61.8	18.1	12.3	40	21.9
102.6	19.3	12.4	43.5	24.2
313.6	21.3	17.9	46	24.7
755.2	31.5	14.4	46	14.5
913.2	31.7	15.0	46	14.3
998.5	30.0	14.4	54	24.0

Note:

The transducer factor includes antenna factor and cable loss.

5#: middle channel 2442MHz, Vertical

FCC PART15 Rad. EM VULB9163 PRE



Quasi-peak measurement

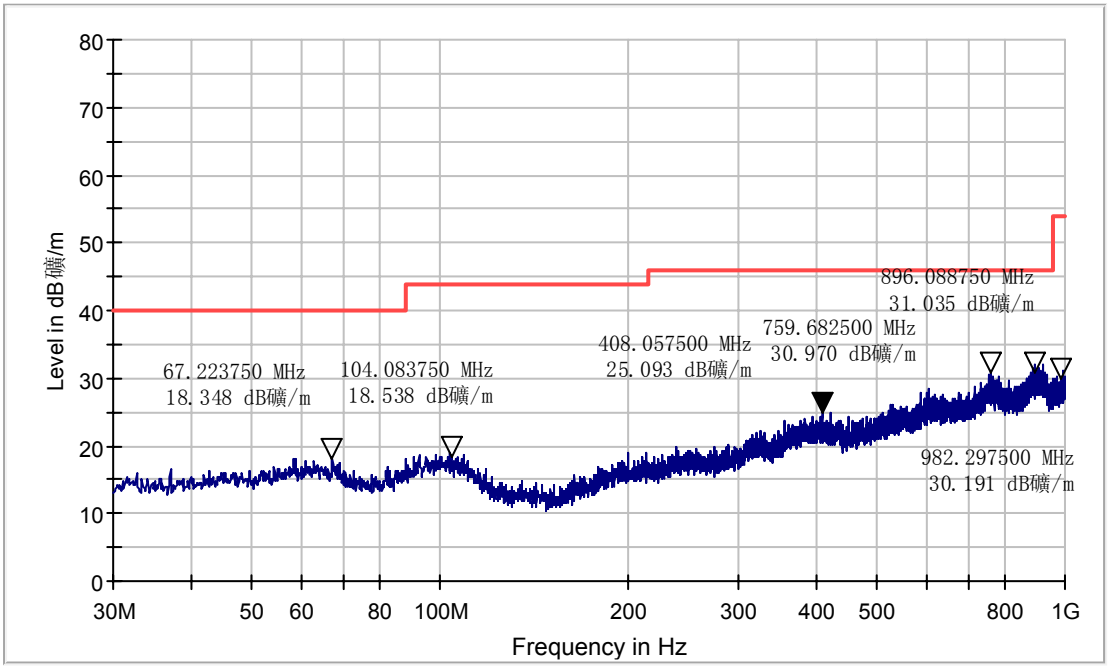
Frequency	Level	Transducer	Limit	Margin
MHz	dBuV/m	dB	dBuV/m	dB
61.5	18.7	12.3	40	21.3
99.1	19.1	12.4	43.5	24.4
197.3	18.7	12.6	43.5	24.8
761.0	30.4	14.4	46	15.6
910.2	31.7	15.0	46	14.3
989.0	29.8	14.5	54	24.2

Note:

The transducer factor includes antenna factor and cable loss.

6#: highest channel 2479MHz, Horizontal

FCC PART15 Rad. EM VULB9163 PRE



Quasi-peak measurement

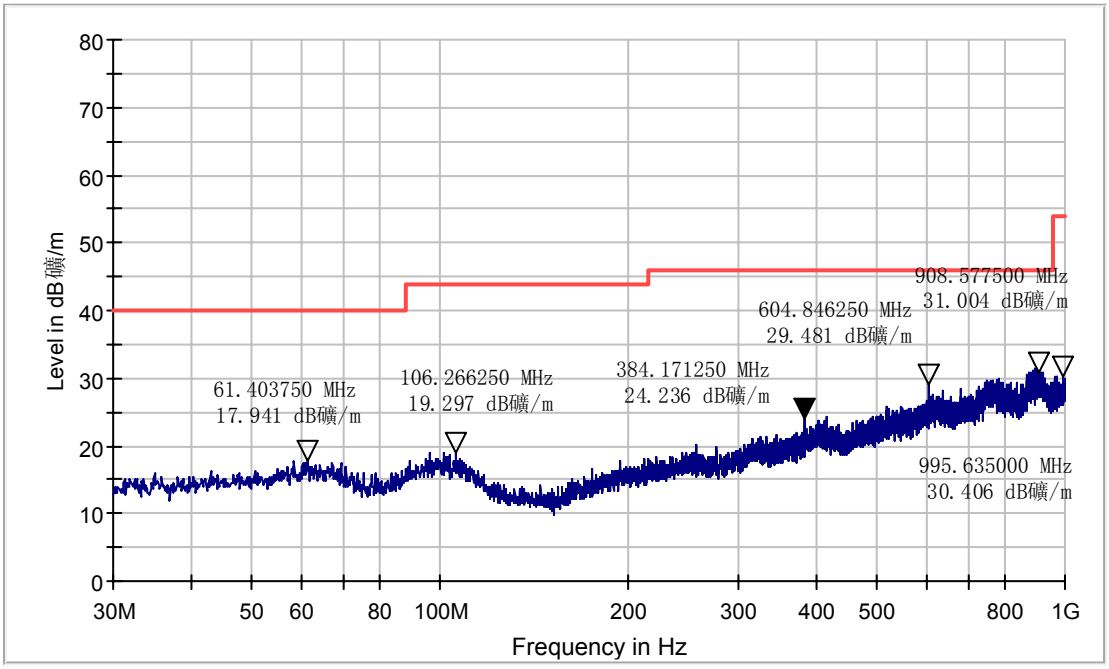
Frequency	Level	Transducer	Limit	Margin
MHz	dBuV/m	dB	dBuV/m	dB
67.2	18.3	12.3	40	21.7
104.1	18.5	12.4	43.5	25.0
408.1	25.1	18.9	46	20.9
759.7	31.0	14.4	46	15.0
896.1	31.0	15.0	46	15.0
982.3	30.2	14.5	54	23.8

Note:

The transducer factor includes antenna factor and cable loss.

6#: highest channel 2479MHz, Vertical

FCC PART15 Rad. EM VULB9163 PRE



Quasi-peak measurement

Frequency	Level	Transducer	Limit	Margin
MHz	dBuV/m	dB	dBuV/m	dB
61.4	17.9	12.3	40	22.1
106.3	19.3	12.4	43.5	24.2
384.2	24.2	18.5	46	21.8
604.8	29.5	18.6	46	16.5
908.9	31.0	15.0	46	15.0
995.6	30.4	14.5	54	23.6

Note:

The transducer factor includes antenna factor and cable loss.

3) 1 GHz~25 GHz Spurious Emissions .Average & PK Measurement

Test the headphone for head

1G-25GHz, Horizontal & Vertical:

Average measurement at lowest channel 2404MHz

Frequency	Level		Transducer	Limit	Margin	
GHz	dBuV/m		dB	dBuV/m	dB	
	Horizontal	Vertical			Horizontal	Vertical
1.202	40.5	39.1	-12.8	54	13.5	14.9
2.394*	40.2	42.3	-12.2		13.8	11.7
2.554	40.5	39.6	-12.1		13.5	14.4
5.232	40.5	39.7	-11.9		13.5	14.3
7.452	40.9	39.1	-8.0		13.1	14.9
10.243	40.6	40.5	-4.6		13.4	13.5
12.725	39.8	39.7	-3.6		14.2	14.3
22.340	39.6	39.9	-0.8		14.4	14.1

Note:

The transducer factor includes antenna factor and cable loss.

* means the max average value for band-edge (frequency range of 2300MHz to 2400MHz, except for harmonics) is the plot measurement at 2.394GHz.

Peak measurement at lowest channel 2404MHz

Frequency	Level		Transducer	Limit	Margin	
GHz	dBuV/m		dB	dBuV/m	dB	
	Horizontal	Vertical			Horizontal	Vertical
1.202	50.1	50.2	-12.8	74	23.9	23.8
2.394*	50.3	51.0	-12.2		23.7	23
2.554	50.4	49.4	-12.1		23.6	24.6
5.435	50.5	49.9	-11.9		23.5	24.1
7.655	49.9	50.7	-8.0		24.1	23.3
11.247	50.6	50.9	-4.5		23.4	23.1
12.828	50.8	50.6	-3.6		23.2	23.4
22.542	49.6	50.6	-0.8		24.4	23.4

Note:

The transducer factor includes antenna factor and cable loss.

* means the max peak value for band-edge (frequency range of 2300MHz to 2400MHz, except for harmonics) is the plot measurement at 2.394GHz.

Average measurement at middle channel 2442MHz

Frequency	Level		Transducer	Limit	Margin	
GHz	dBuV/m		dB	dBuV/m	dB	
	Horizontal	Vertical			Horizontal	Vertical
1.221	40.4	40.2	-12.8	54	13.6	13.8
2.385	40.7	40.4	-12.2		13.3	13.6
2.586	40.6	40.4	-12.1		13.4	13.6
5.332	40.2	39.8	-11.9		13.8	14.2
7.552	40.7	40.0	-8.0		13.3	14.0
10.343	40.2	39.7	-4.6		13.8	14.3
12.625	40.9	40.2	-3.6		13.1	13.8
23.340	40.4	40.8	-0.8		13.6	13.2
Note: The transducer factor includes antenna factor and cable loss.						

Peak measurement at middle channel 2442MHz

Frequency	Level		Transducer	Limit	Margin	
GHz	dBuV/m		dB	dBuV/m	dB	
	Horizontal	Vertical			Horizontal	Vertical
1.221	50.4	50.2	-12.8	74	23.6	23.8
2.385	50.3	50.5	-12.2		23.7	23.5
2.586	50.5	50.7	-12.1		23.5	23.3
5.733	50.4	50.5	-11.9		23.6	23.5
7.645	50.7	50.5	-8.0		23.3	23.5
11.578	50.4	50.4	-4.5		23.6	23.6
12.865	50.4	50.4	-3.6		23.6	23.6
22.946	50.5	50.2	-0.8		23.5	23.8
Note: The transducer factor includes antenna factor and cable loss.						

Average measurement at highest channel 2479MHz

Frequency	Level		Transducer	Limit	Margin	
GHz	dBuV/m		dB	dBuV/m	dB	
	Horizontal	Vertical			Horizontal	Vertical
1.240	40.7	40.2	-12.8	54	13.3	13.8
2.382	40.2	40.8	-12.2		13.8	13.2
2.489*	50.9	47.8	-12.1		3.1	6.2
5.335	40.6	40.4	-11.9		13.4	13.6
7.478	40.4	40.2	-8.0		13.6	13.8
10.318	40.3	39.7	-4.6		13.7	14.3
13.925	40.4	40.5	-3.5		13.6	13.5
23.362	40.4	40.2	-0.8		13.6	13.8

Note:

The transducer factor includes antenna factor and cable loss.

* means the max average value for band-edge (frequency range of 2483.5MHz to 2583.5MHz, except for harmonics) is the plot measurement at 2.489GHz.

Peak measurement at highest channel 2479MHz

Frequency	Level		Transducer	Limit	Margin	
GHz	dBuV/m		dB	dBuV/m	dB	
	Horizontal	Vertical			Horizontal	Vertical
1.240	50.4	50.1	-12.8	74	23.6	23.9
2.382	50.4	50.2	-12.2		23.6	23.8
2.489*	54.6	51.6	-12.1		19.4	22.4
5.623	50.5	50.1	-11.9		23.5	23.9
7.682	50.5	50.7	-8.0		23.5	23.3
11.524	50.5	50.3	-4.5		23.5	23.7
12.915	50.2	49.9	-3.6		23.8	24.1
23.548	49.8	50.2	-0.8		24.2	23.8

Note:

The transducer factor includes antenna factor and cable loss.

* means the max peak value for band-edge (frequency range of 2483.5MHz to 2583.5MHz, except for harmonics) is the plot measurement at 2.489GHz.

6.2. Occupied Bandwidth

Test Requirement:	FCC Part15.215
Test Method:	ANSI C63.4: 2003
Detector:	Peak for scan (The resolution bandwidth was 1MHz and the video bandwidth was 1MHz, span was 20MHz) maximised peak hold
Test Date:	Jun. 28, 2013

6.2.1 E.U.T. Operation

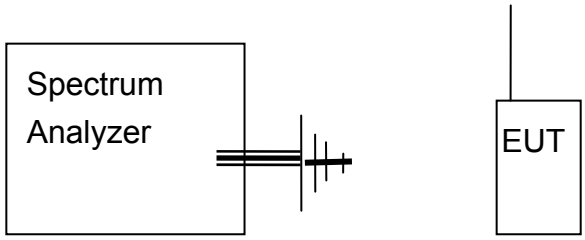
Operating Environment:

Temperature: 25°C Humidity:45% RH Atmospheric Pressure: 1020mBar

EUT Operation:

Test the EUT work normally in on mode during the whole test.

6.2.2 Test Setup



6.2.3 Test Procedure

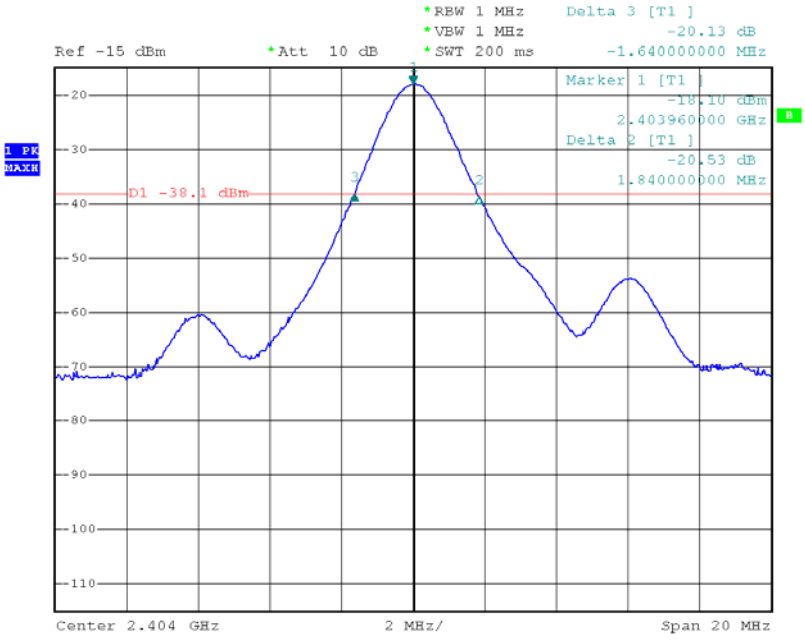
ANSI STANDARD C63.4-2003 10.1.7 MEASUREMENT PROCEDURES:

An initial pre-scan was performed in the 3m chamber using the spectrum analyzer in peak detection mode. Average measurements were conducted based on the peak sweep graph. 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 polarities.

6.2.4 Measurement Data

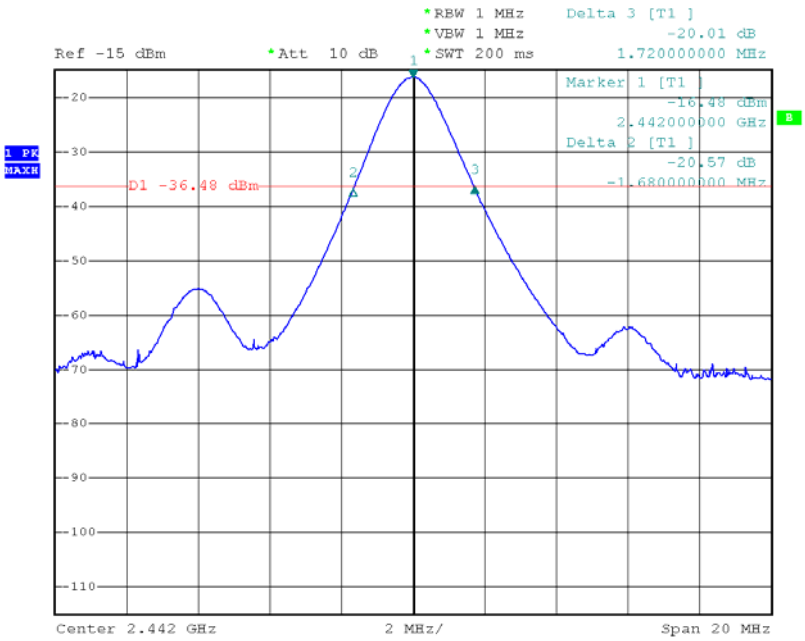
Test for the Headphone with switch ON.

Maximum Peak hold measurement for lowest channel 2404.0MHz



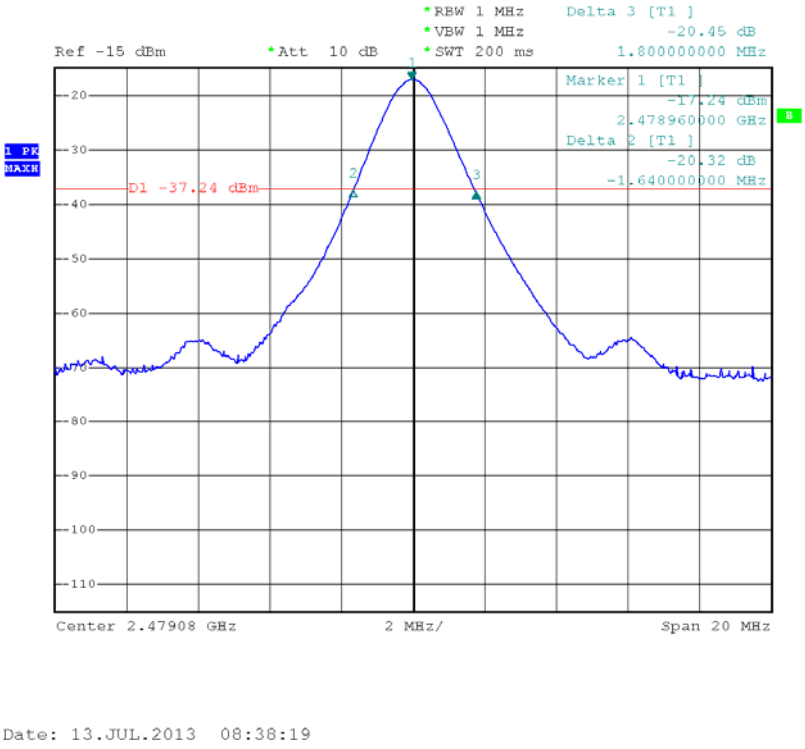
Date: 13.JUL.2013 08:28:25

Maximum Peak hold measurement for middle channel 2442.0MHz



Date: 13.JUL.2013 08:31:15

Maximum Peak hold measurement for highest channel 2479.0MHz



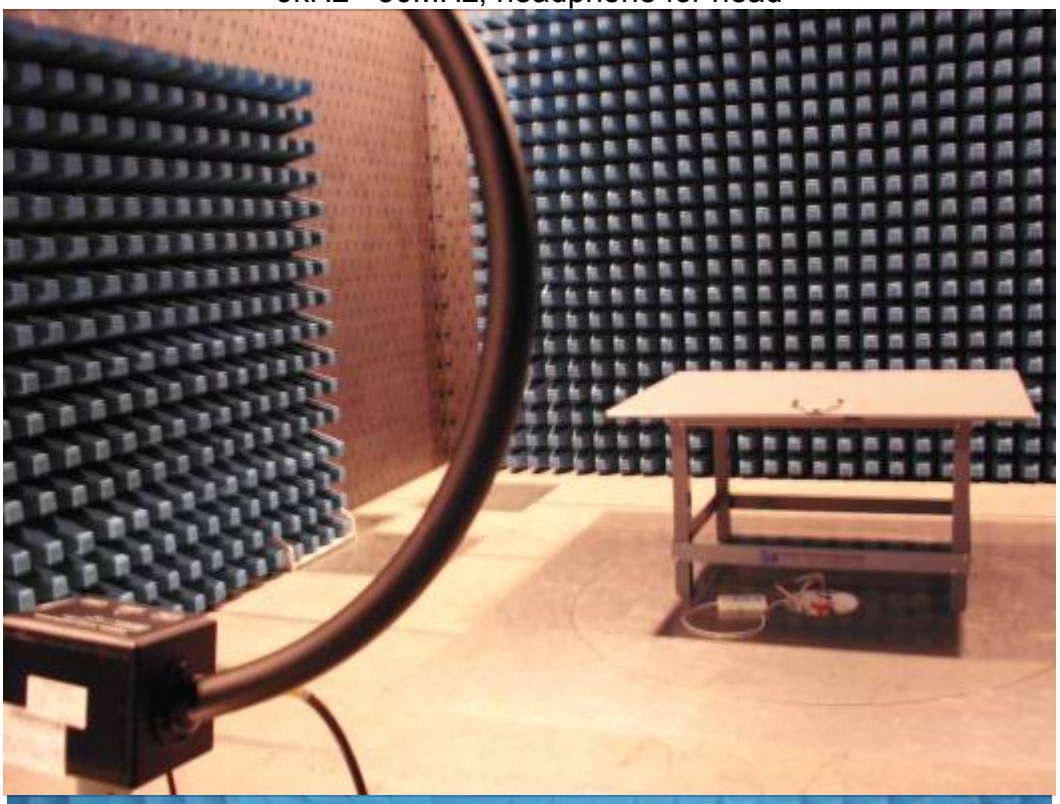
The -20dB Bandwidth:

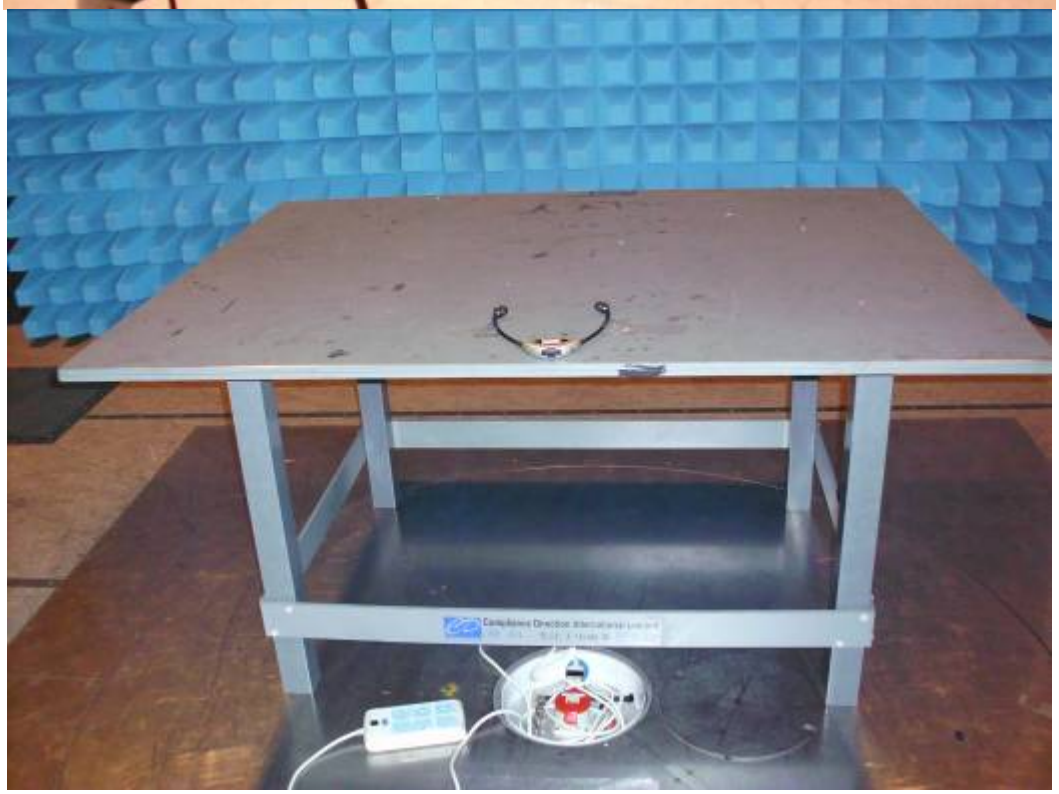
	ΔFL- / MHz	ΔFL+ / MHz	**-20dB Bandwidth/ MHz**
Lowest Ch.: 2404MHz	-1.64	1.84	3.48
Middle Ch.: 2442MHz	-1.72	1.68	3.40
Highest Ch.: 2479MHz	-180	1.64	3.44

7. Photographs

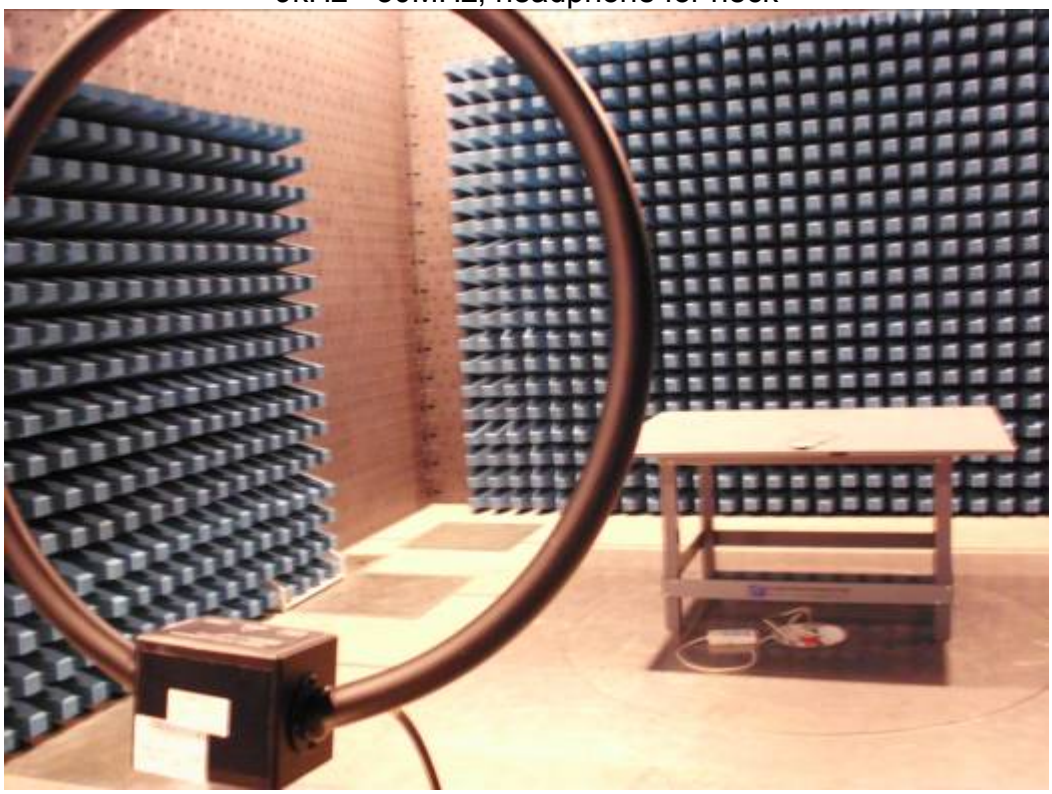
7.1. Radiated Emission Test Setup

9kHz - 30MHz, headphone for head

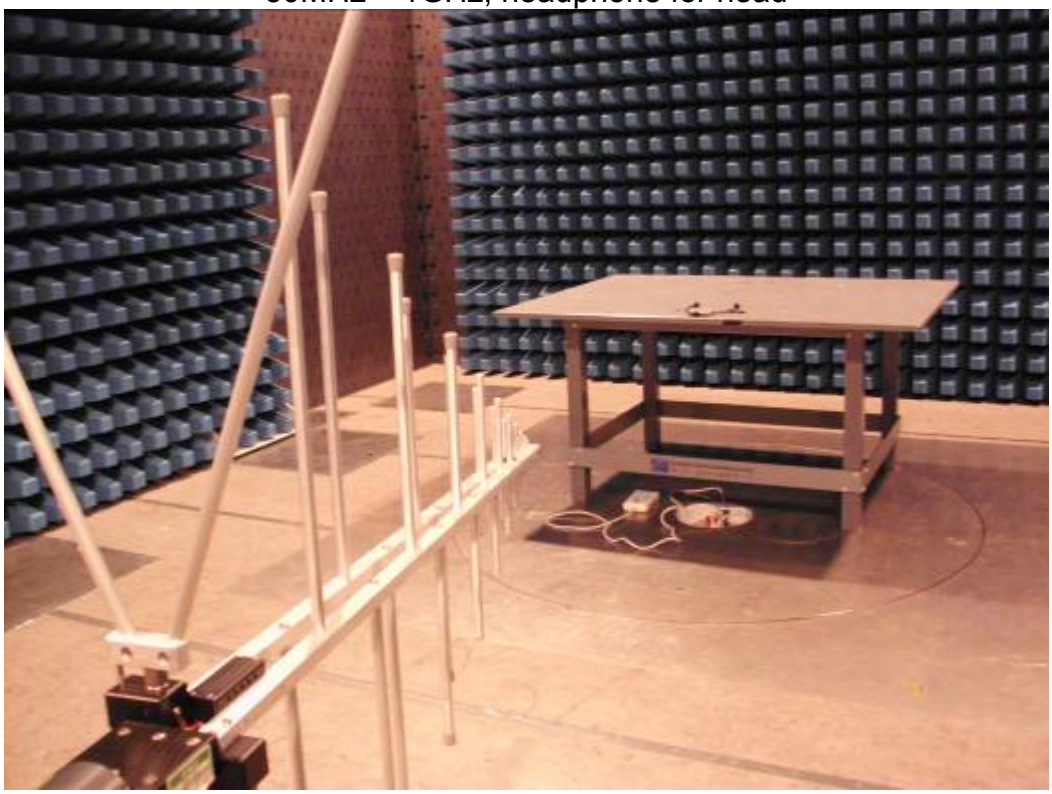




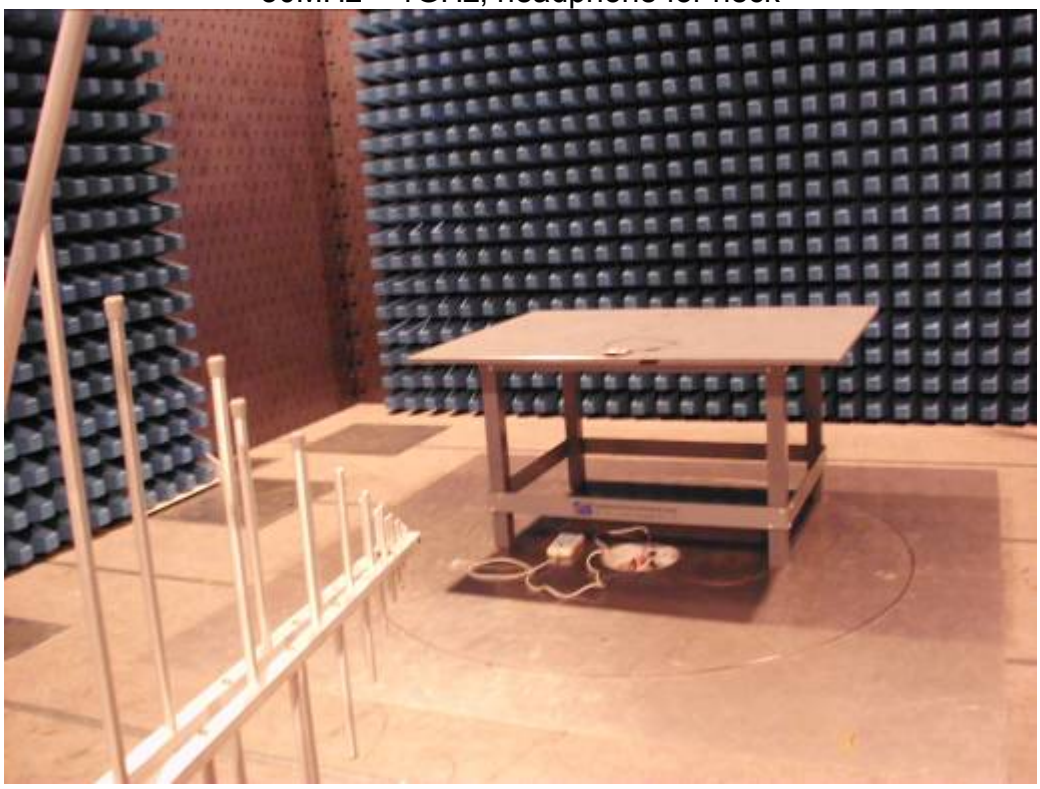
9kHz - 30MHz, headphone for neck

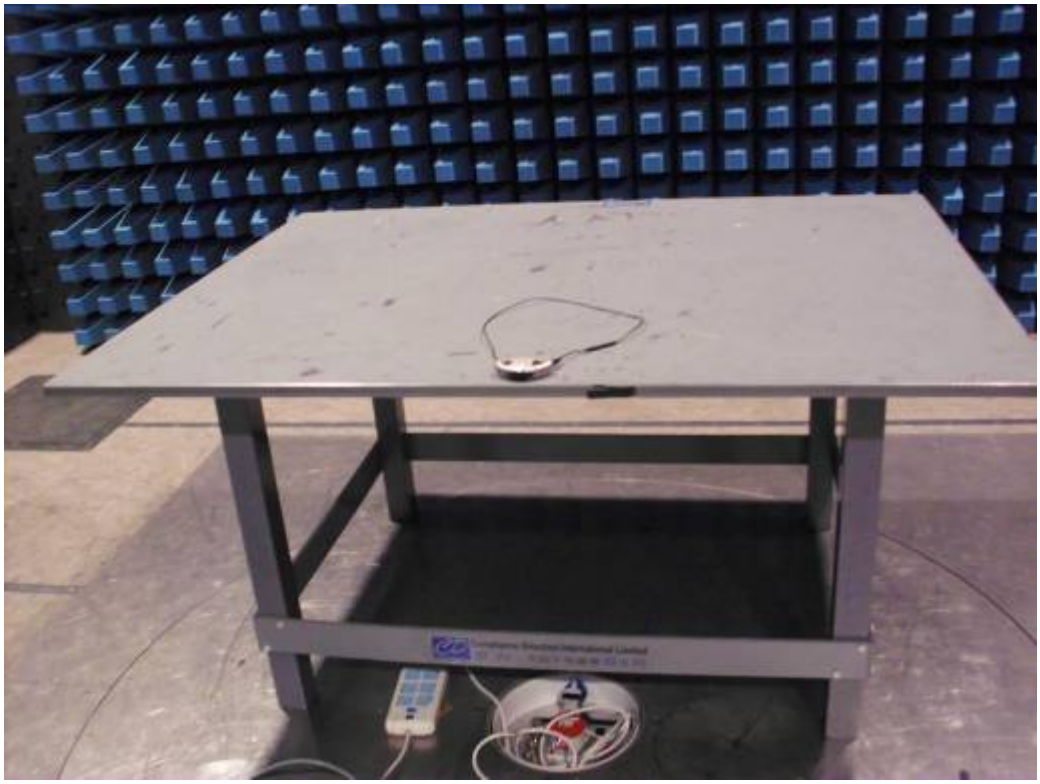


30MHz – 1GHz, headphone for head

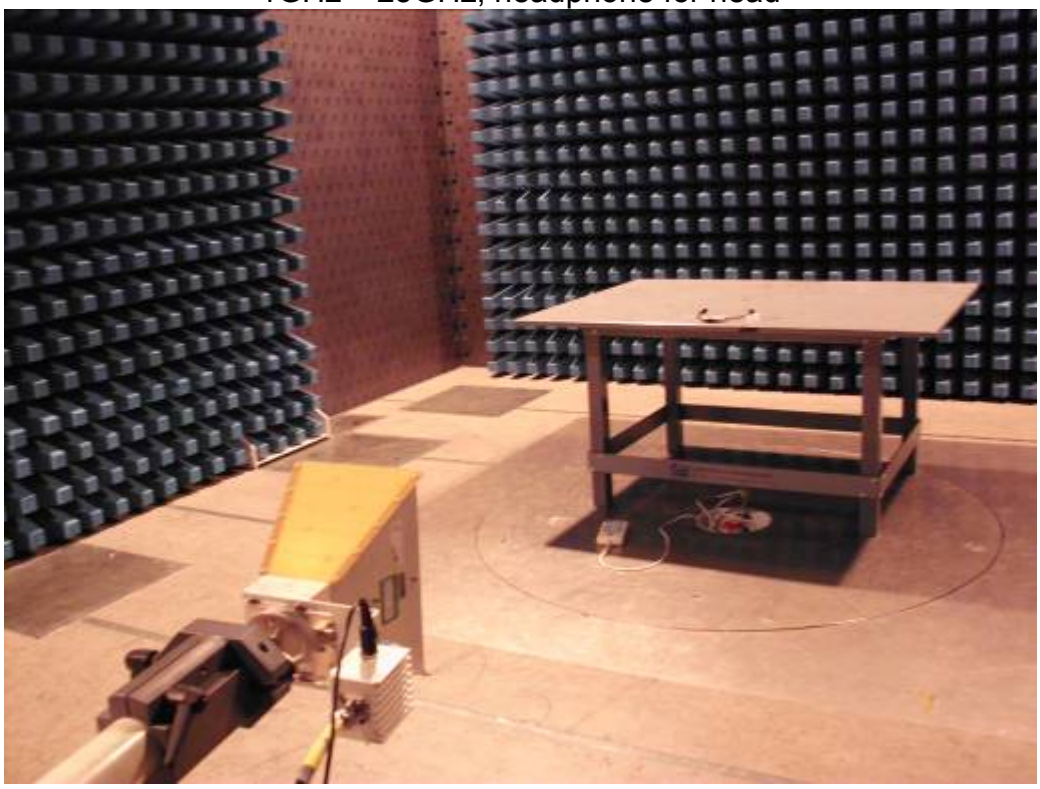


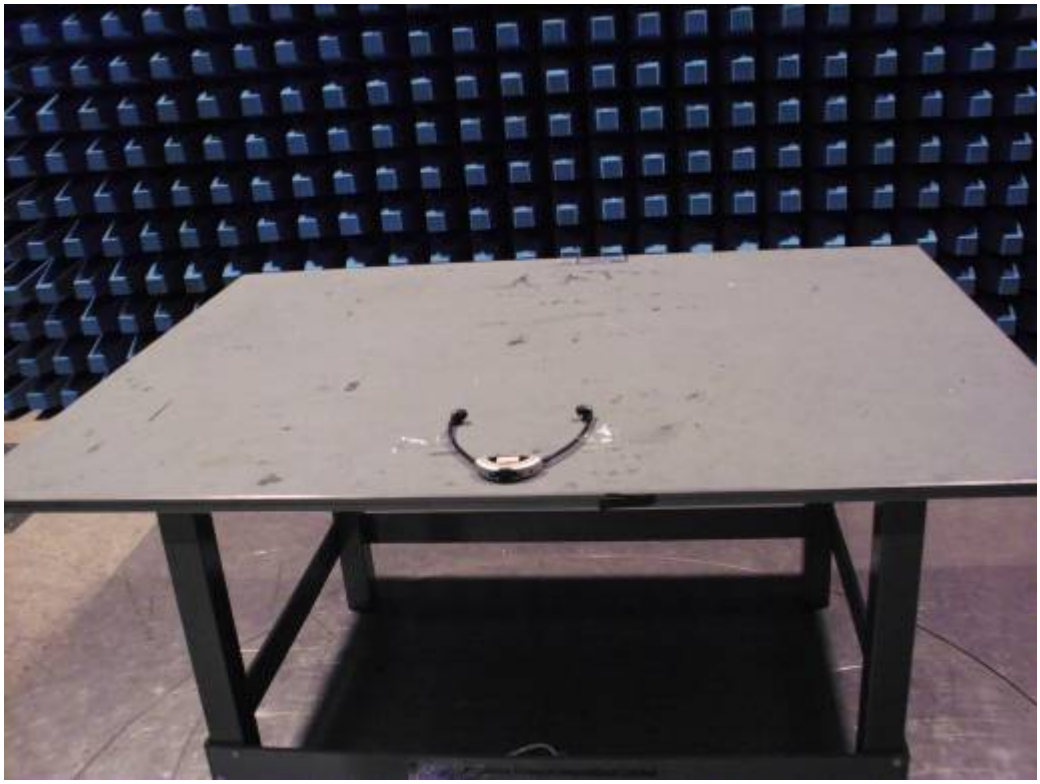
30MHz – 1GHz, headphone for neck



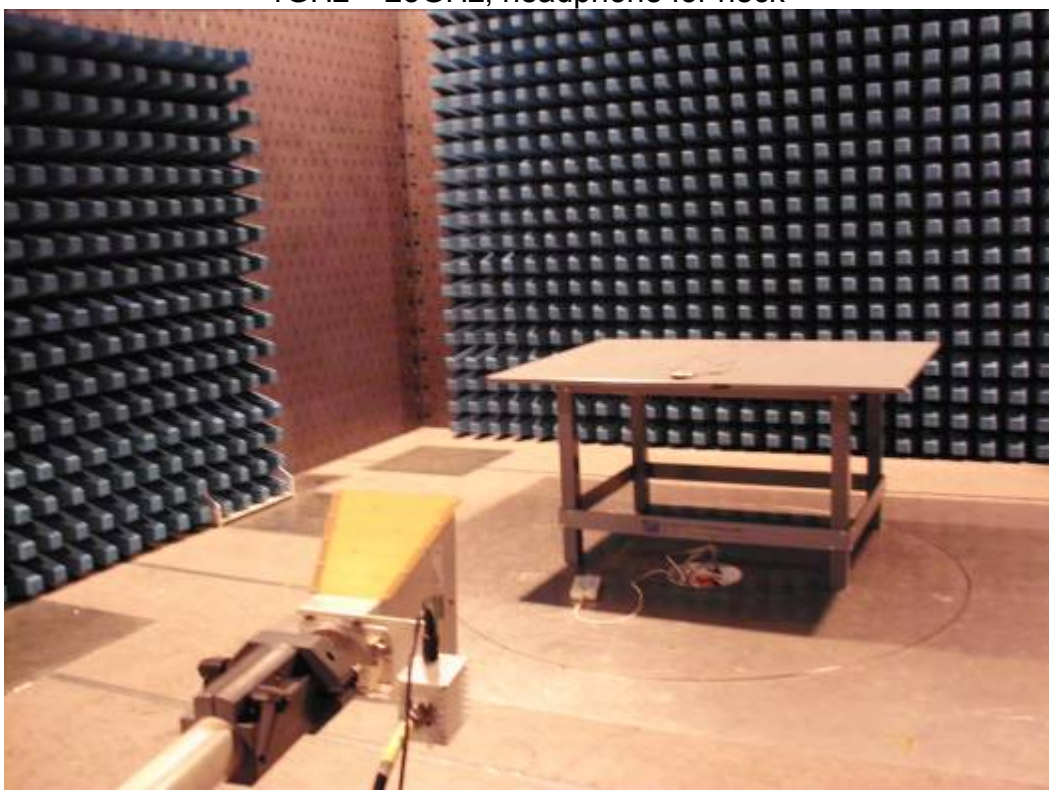


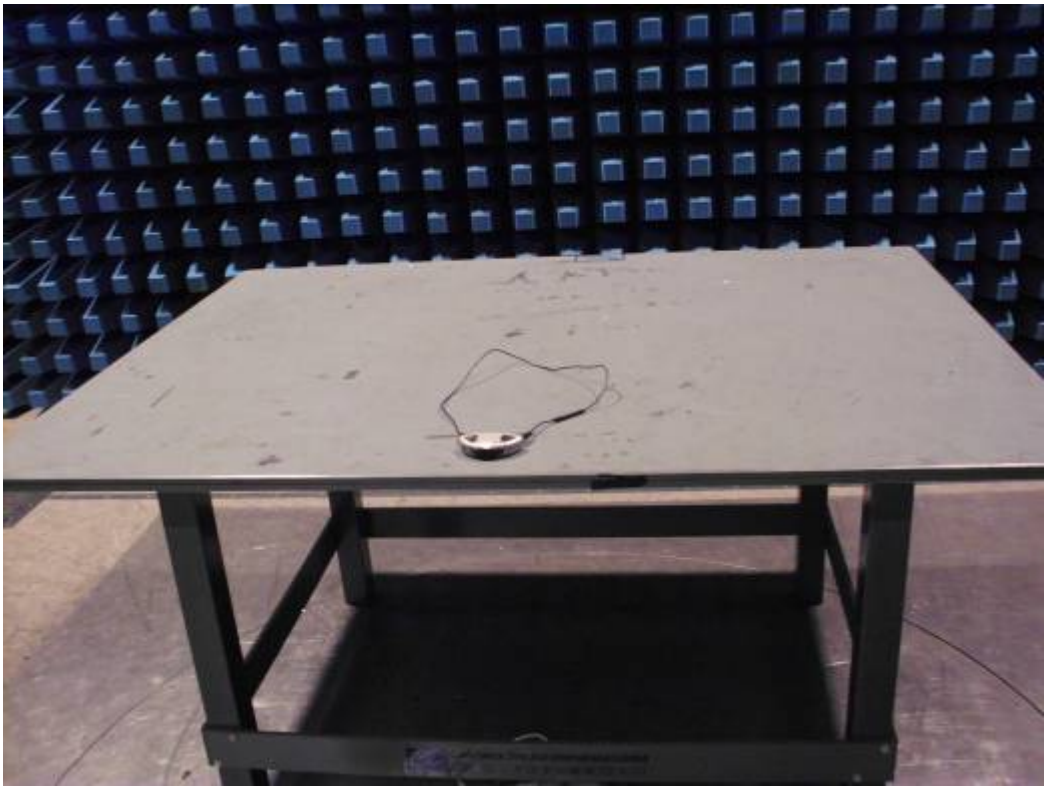
1GHz – 25GHz, headphone for head





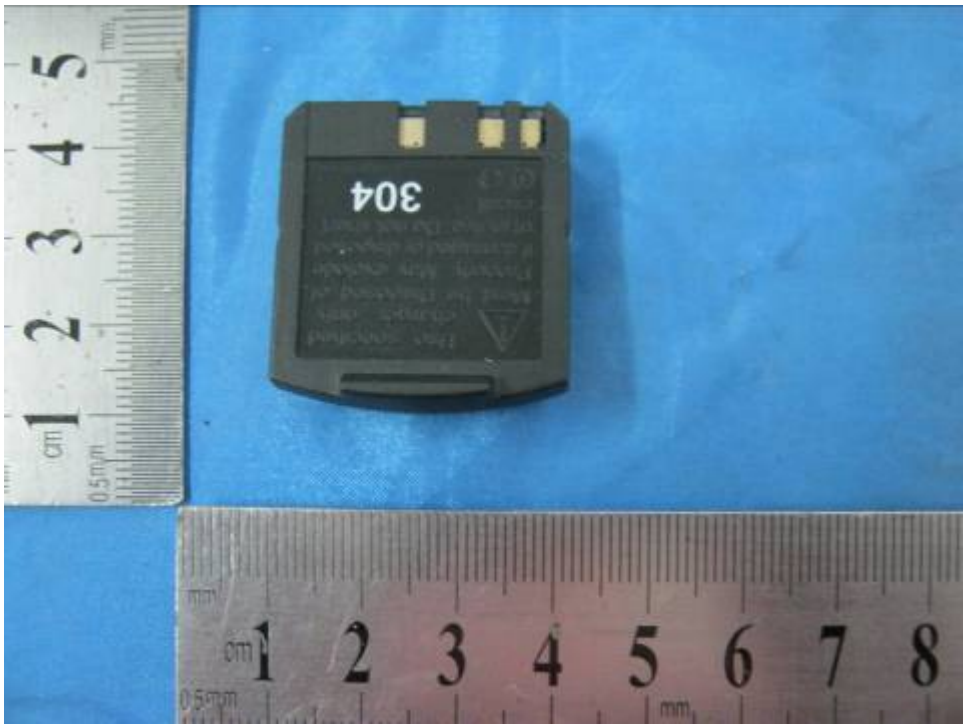
1GHz – 25GHz, headphone for neck

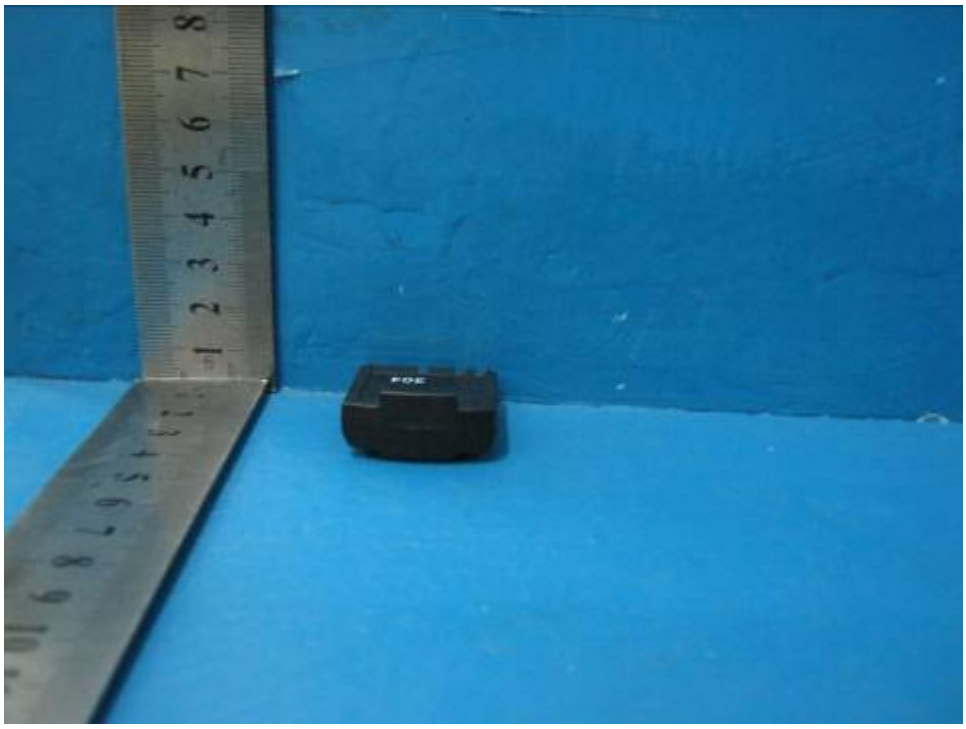




7.2. EUT Constructional Details

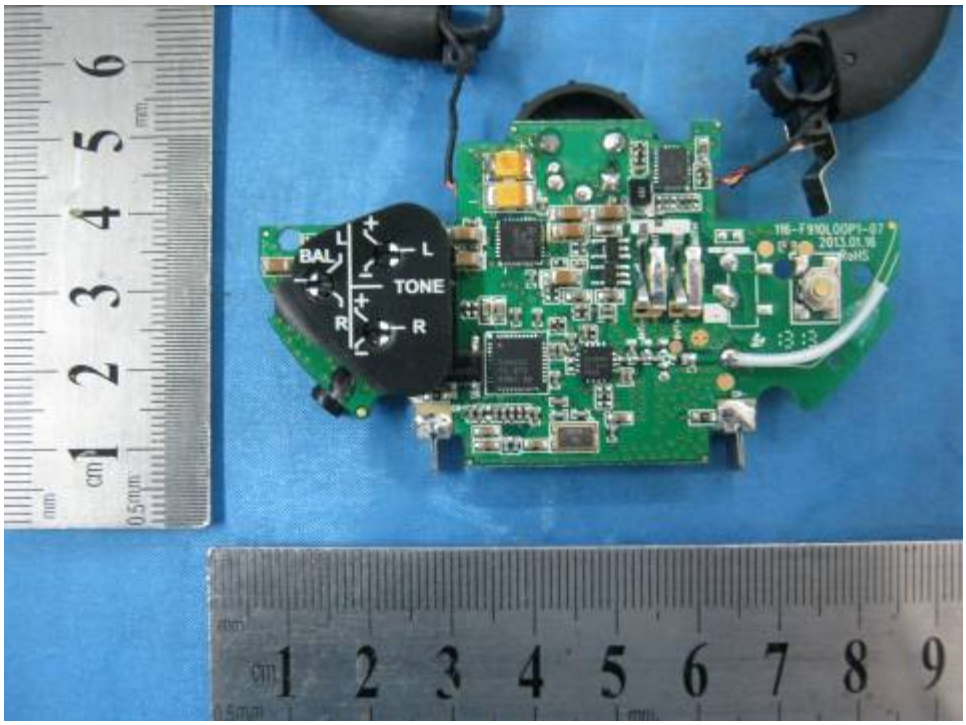
Battery

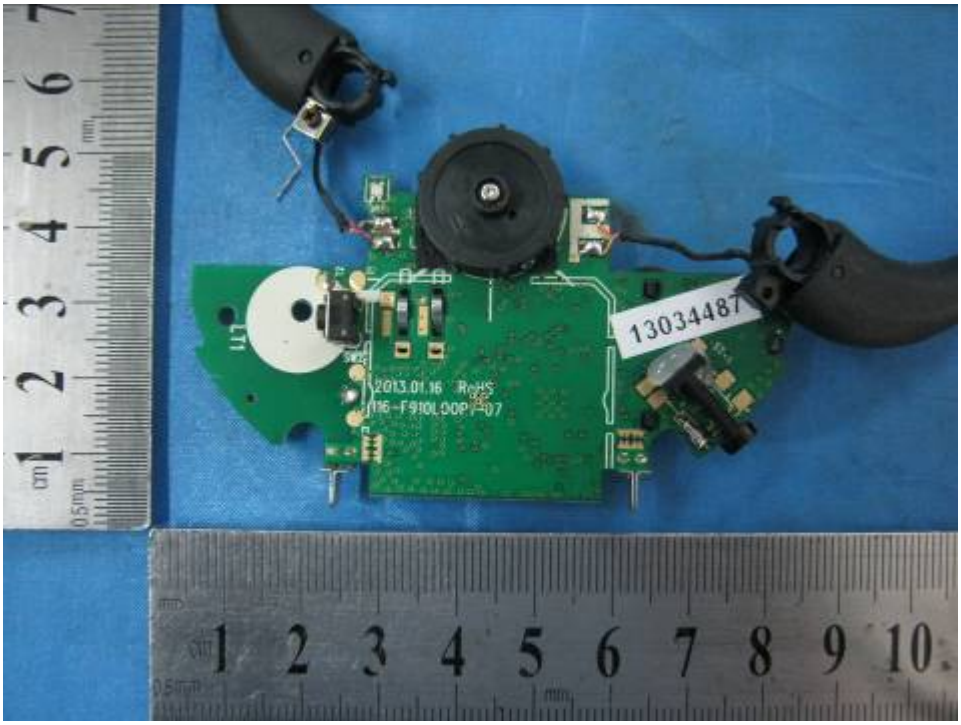


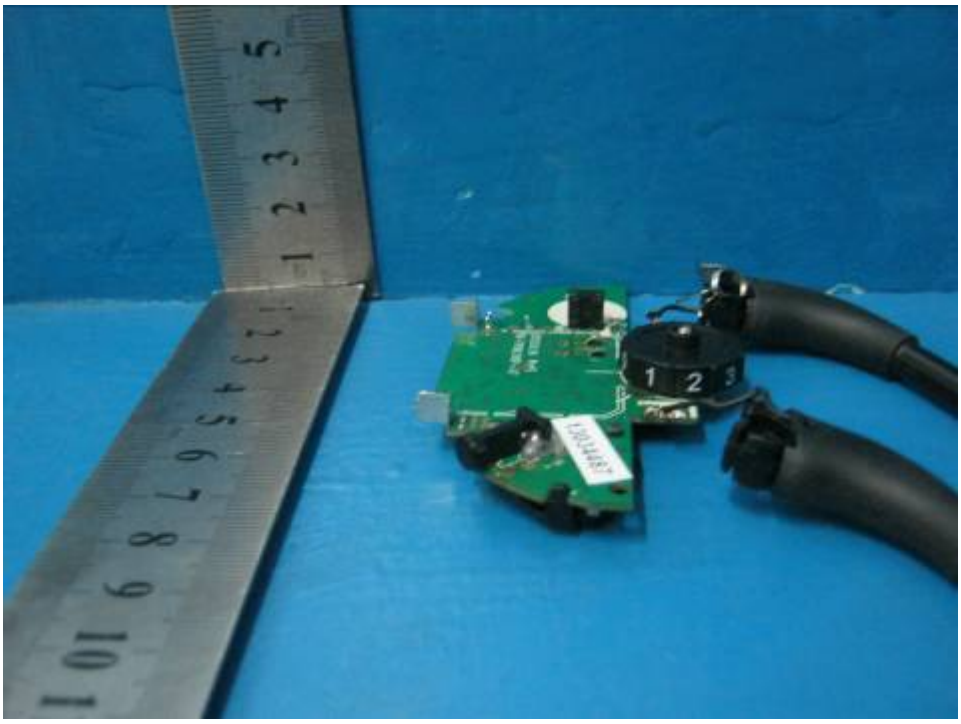


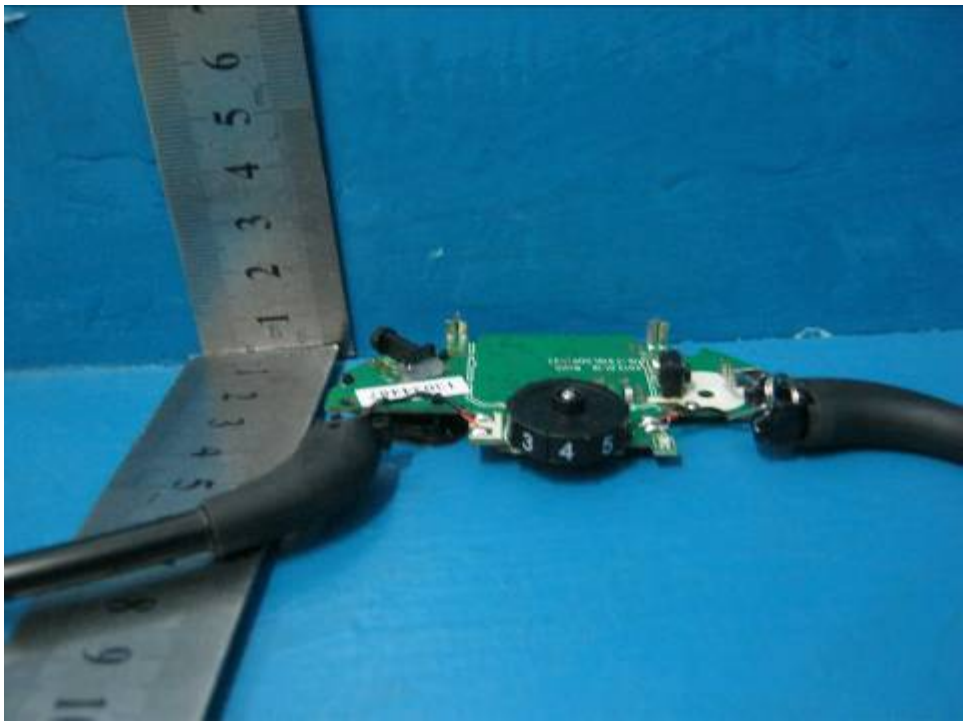

304

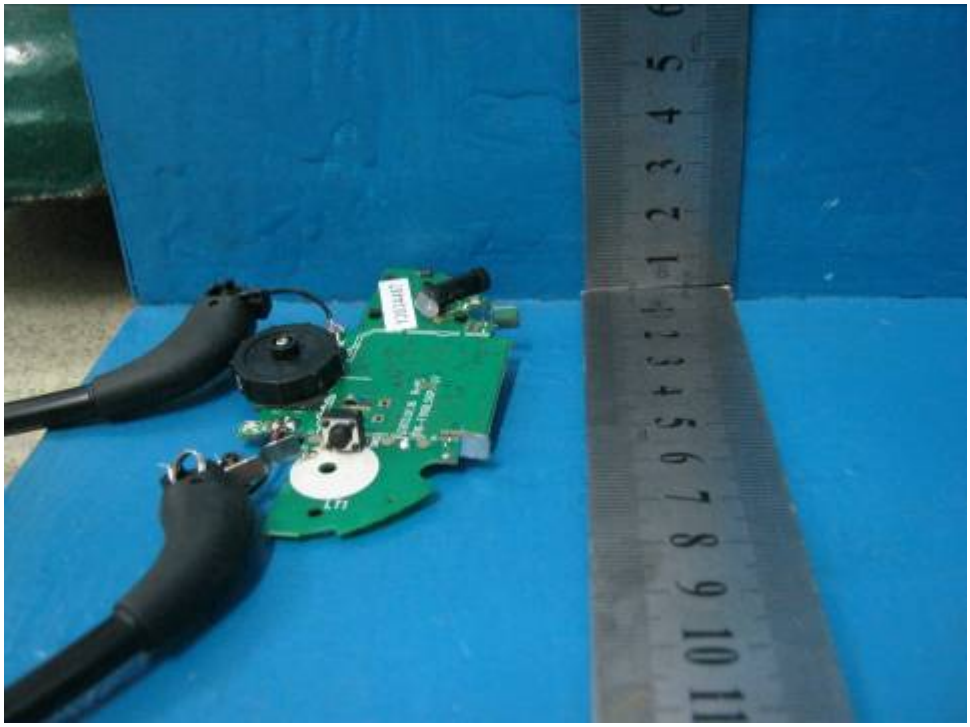
Headphone for head (headset)

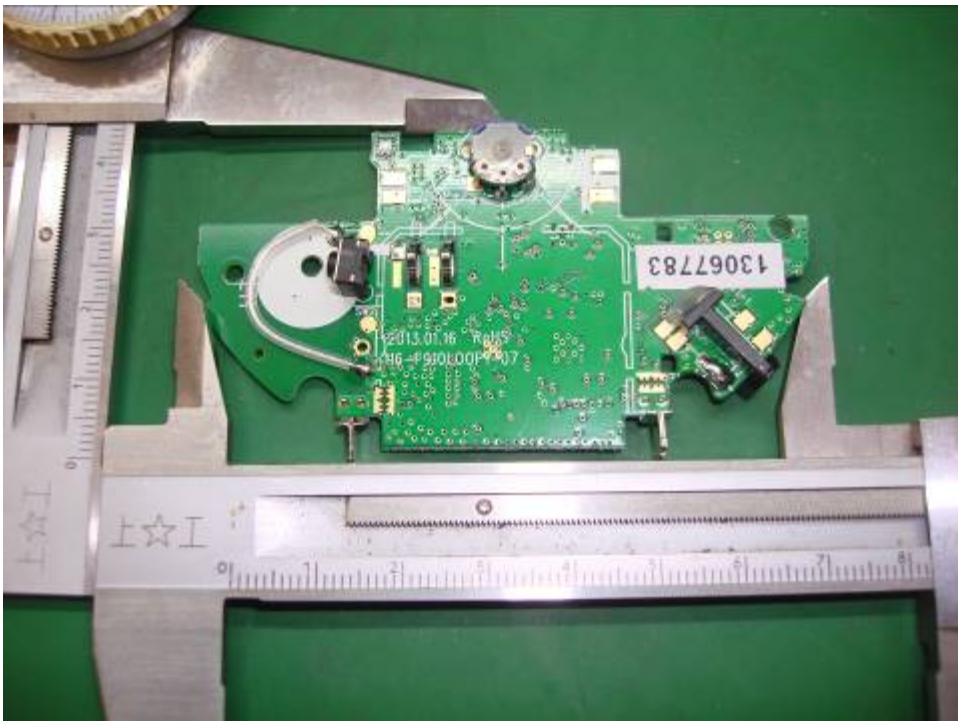

BAL
L
TONE
R
R
1 2 3 4 5 6 7 8 9

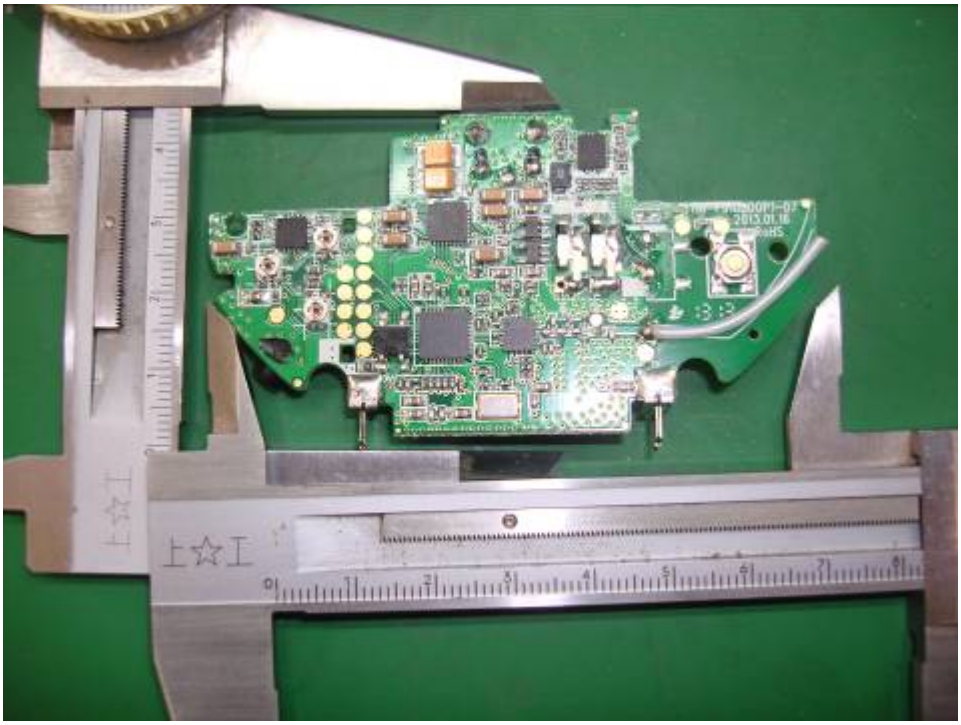

13034487
2013.01.16 RoHS
1 2 3 4 5 6 7 8 9 10

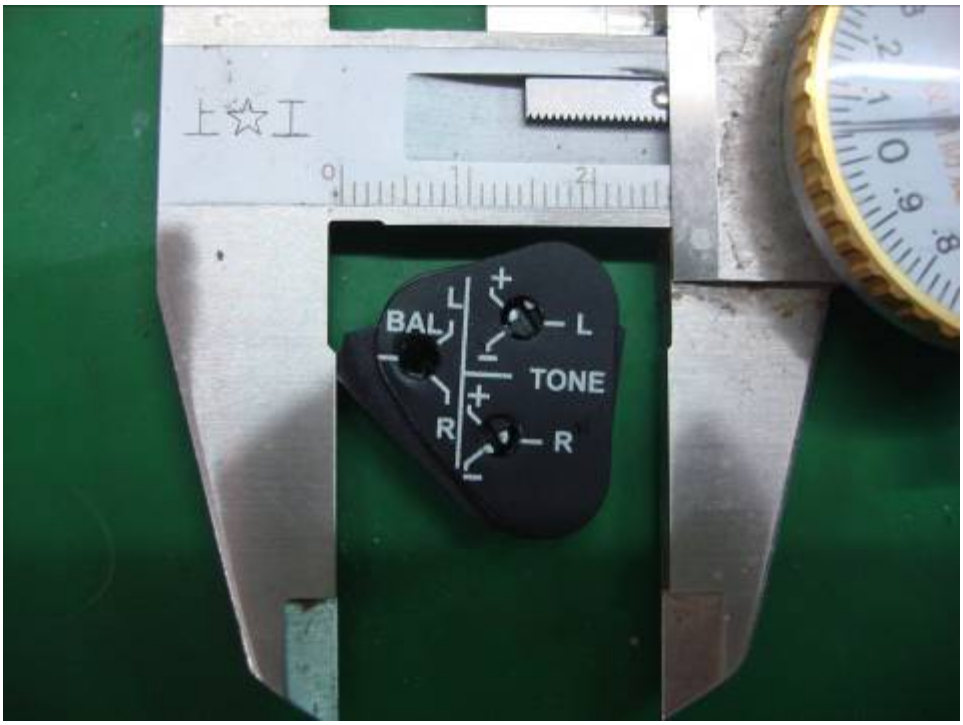


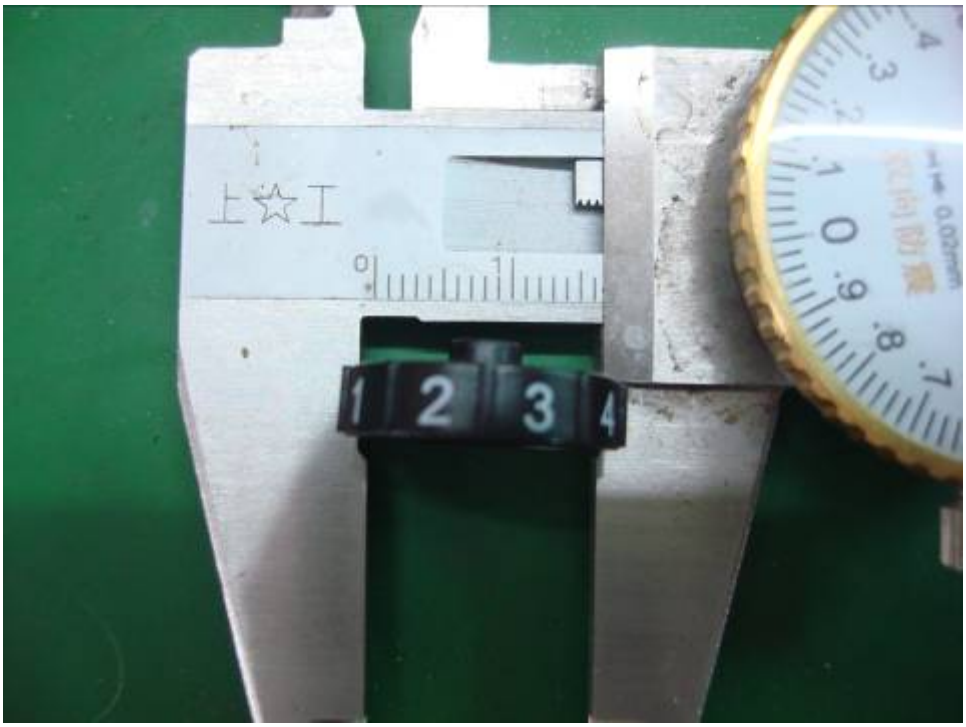


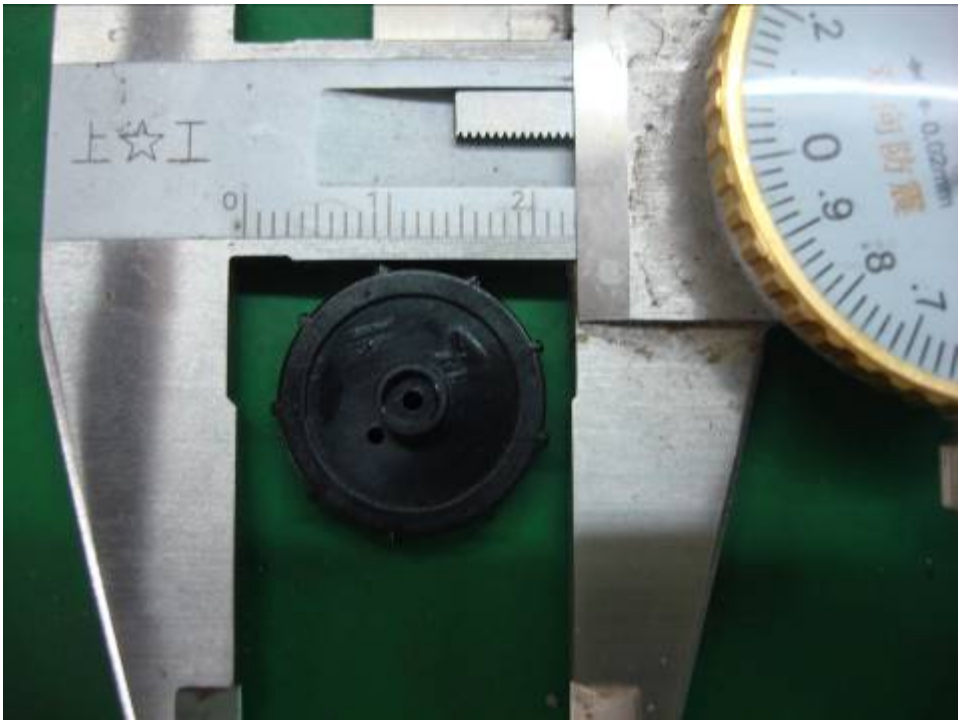


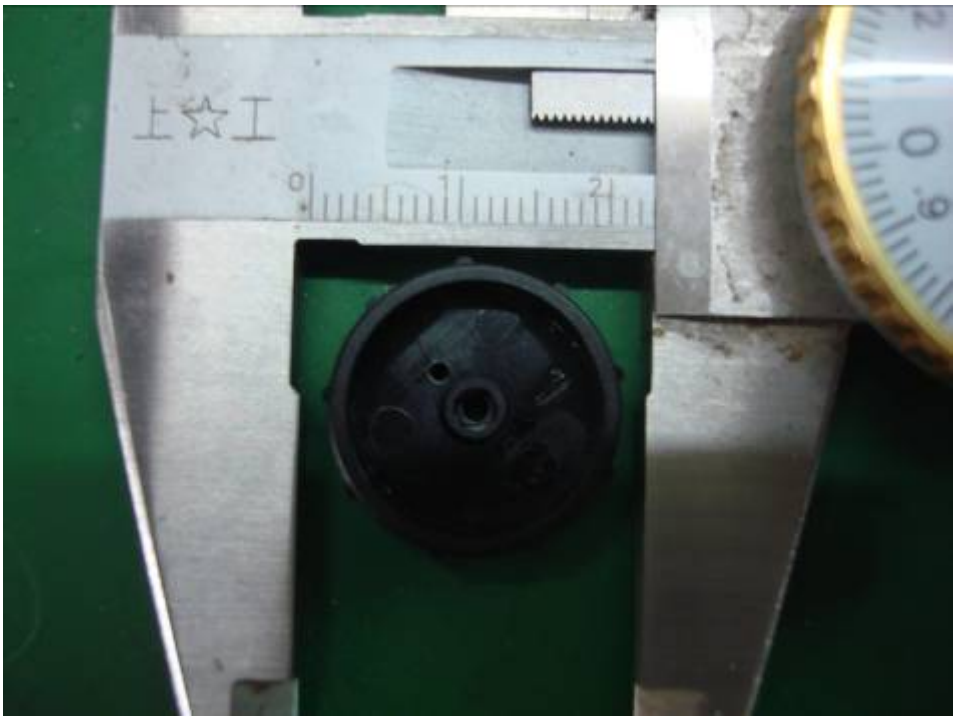

13067783




BAL
L
TONE
R
L
R

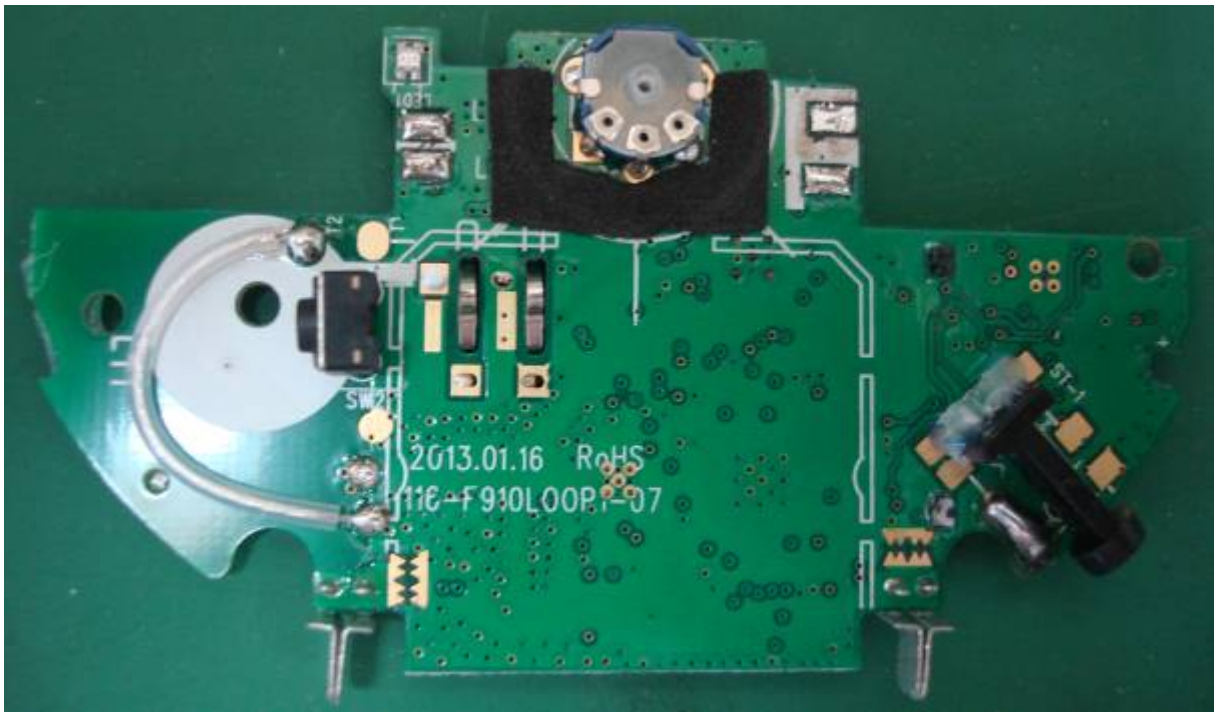

1 2 3 4

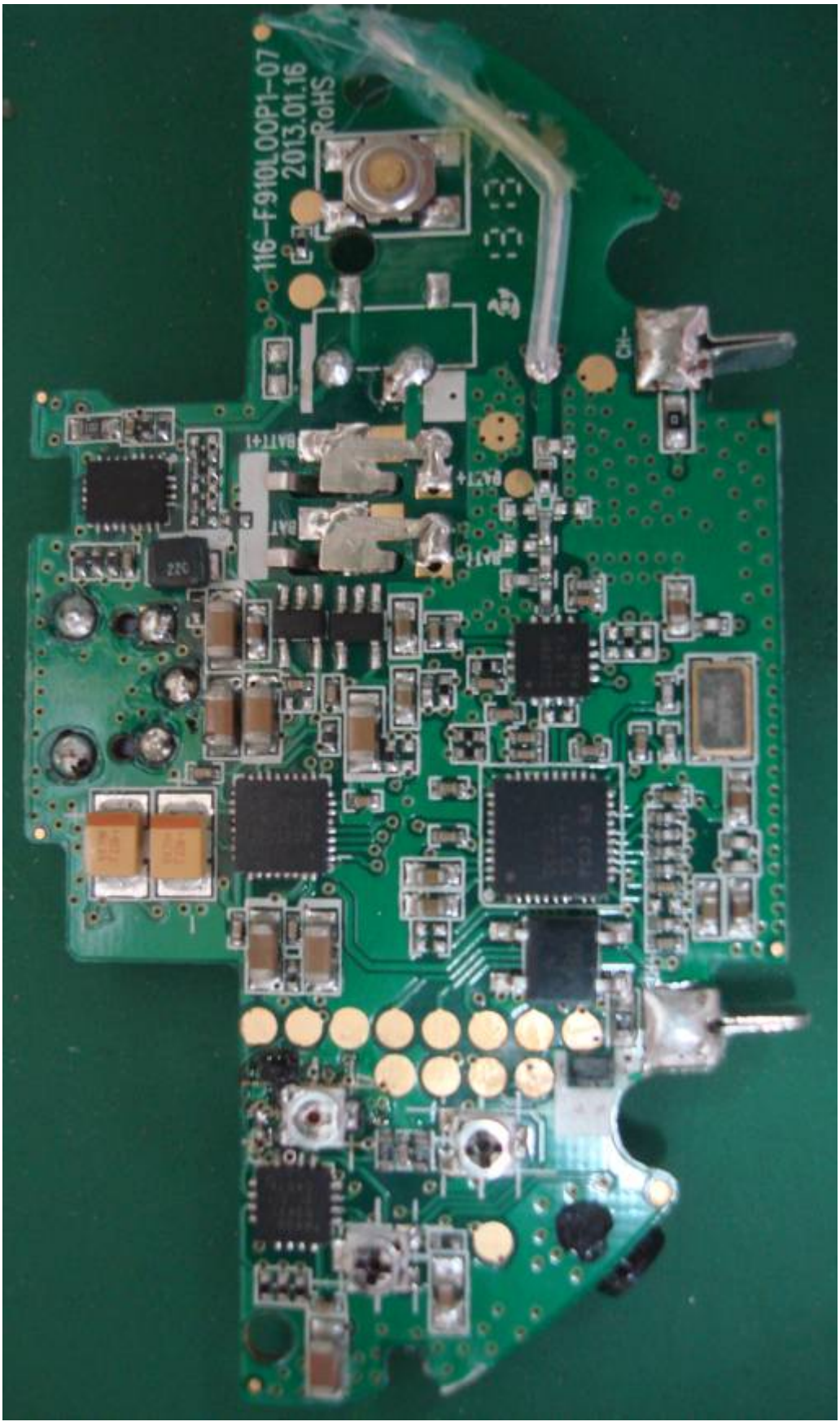




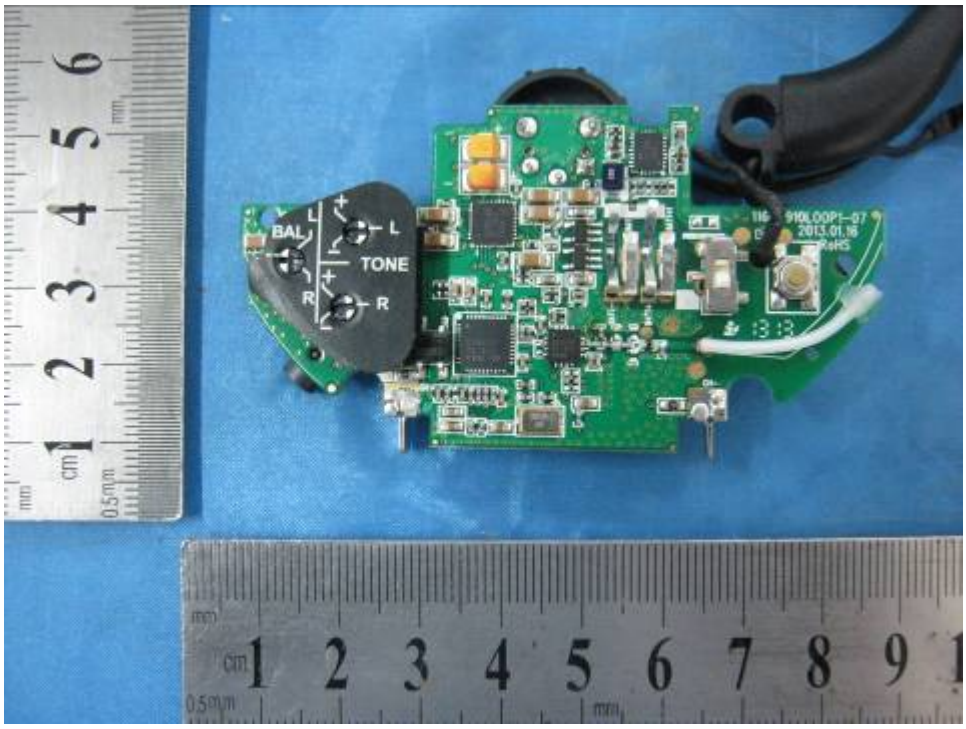

13034487
LT1
SW2
2013.01.16 RoHS

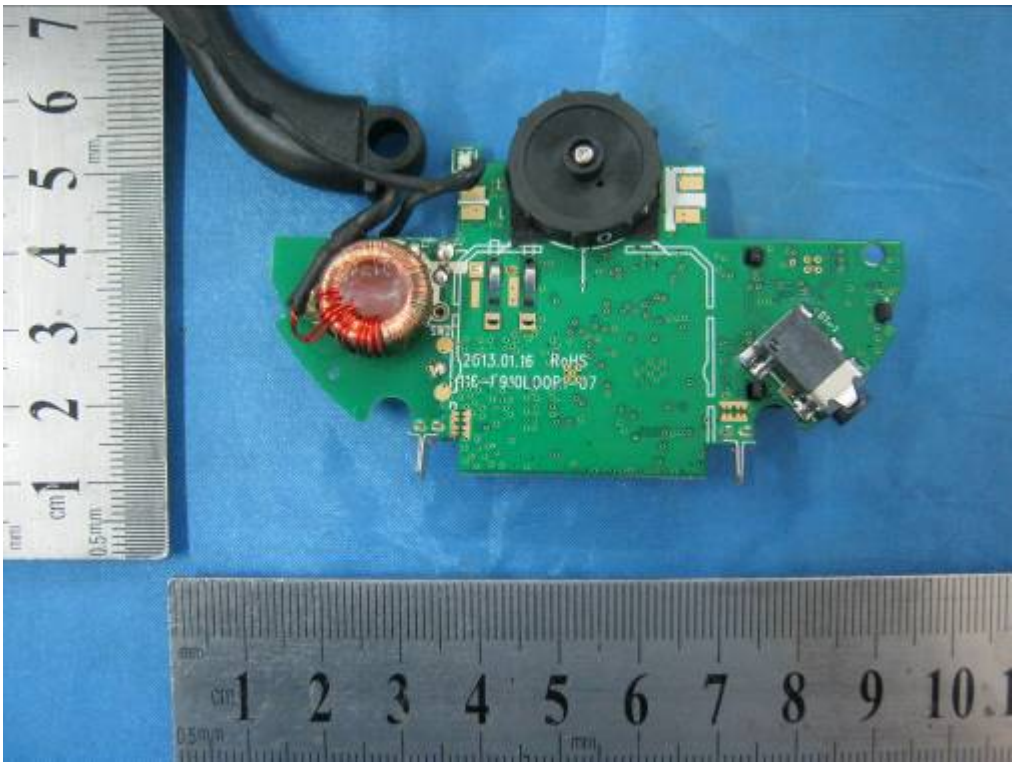

BAL
L
TONE
R
R
116-F910LOOP1-07
2013.01.16
RoHS

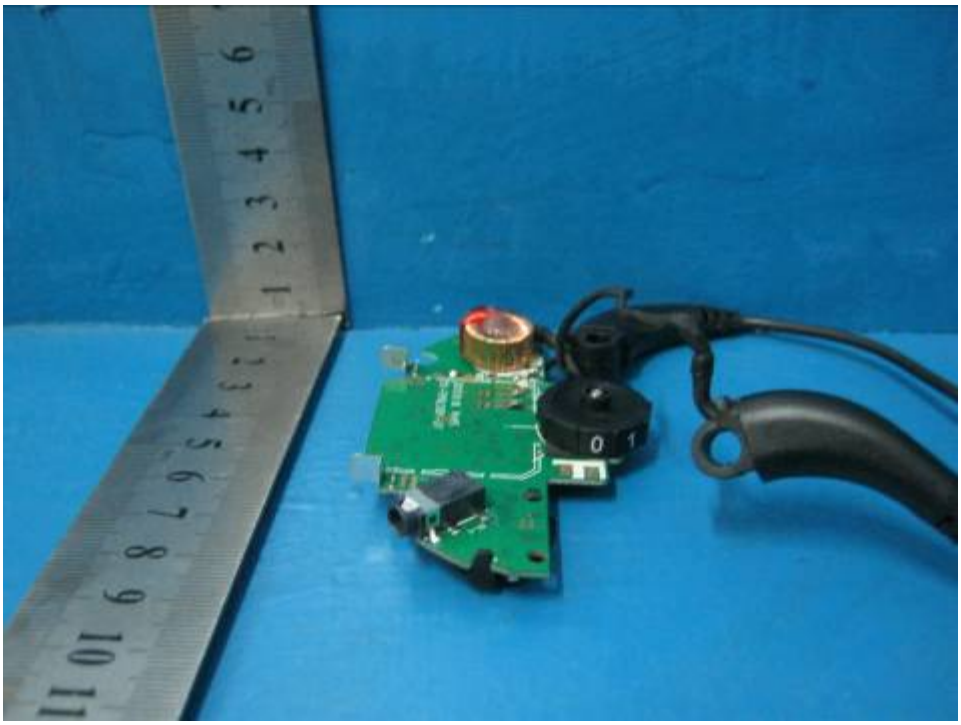

2013.01.16 RoHS

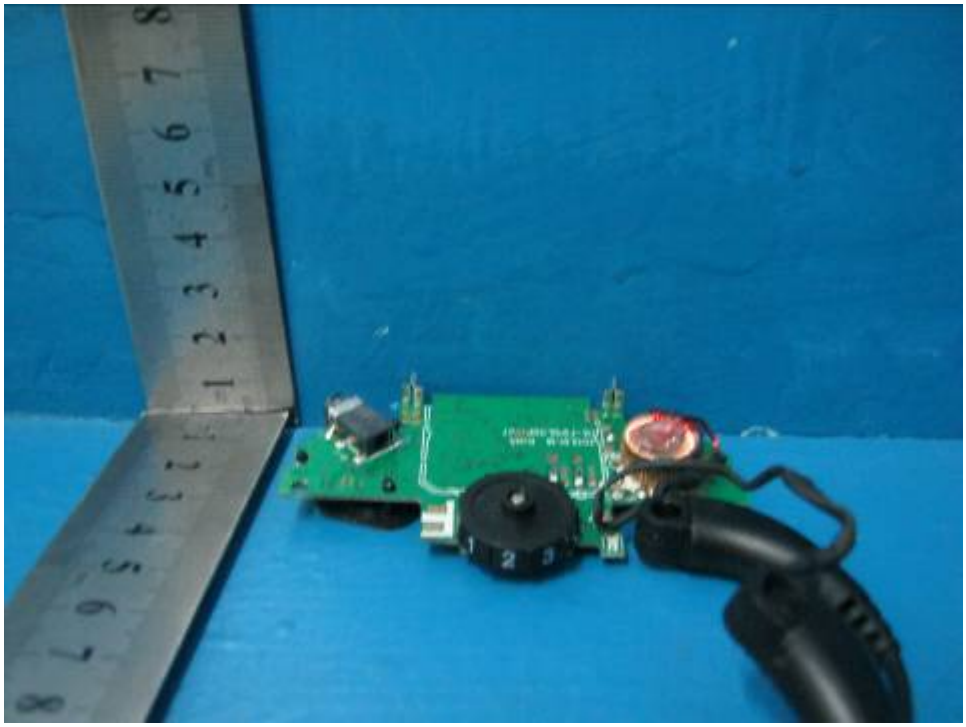

116-F910L00P1-07
2013.01.16
RoHS

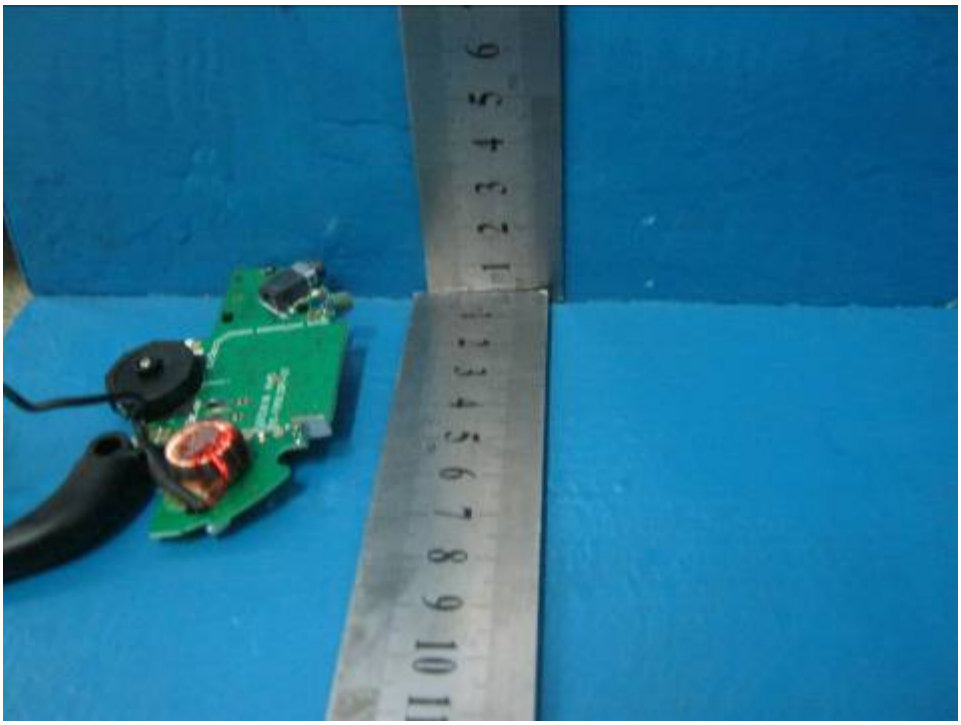
Headphone for neck

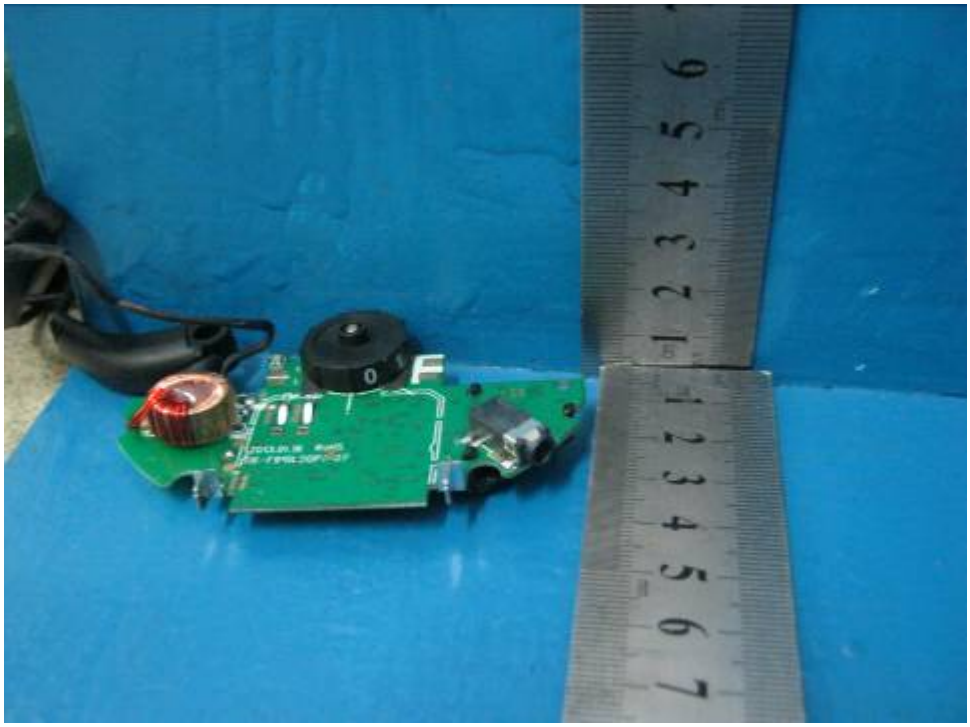

BAL
L
TONE
R
R

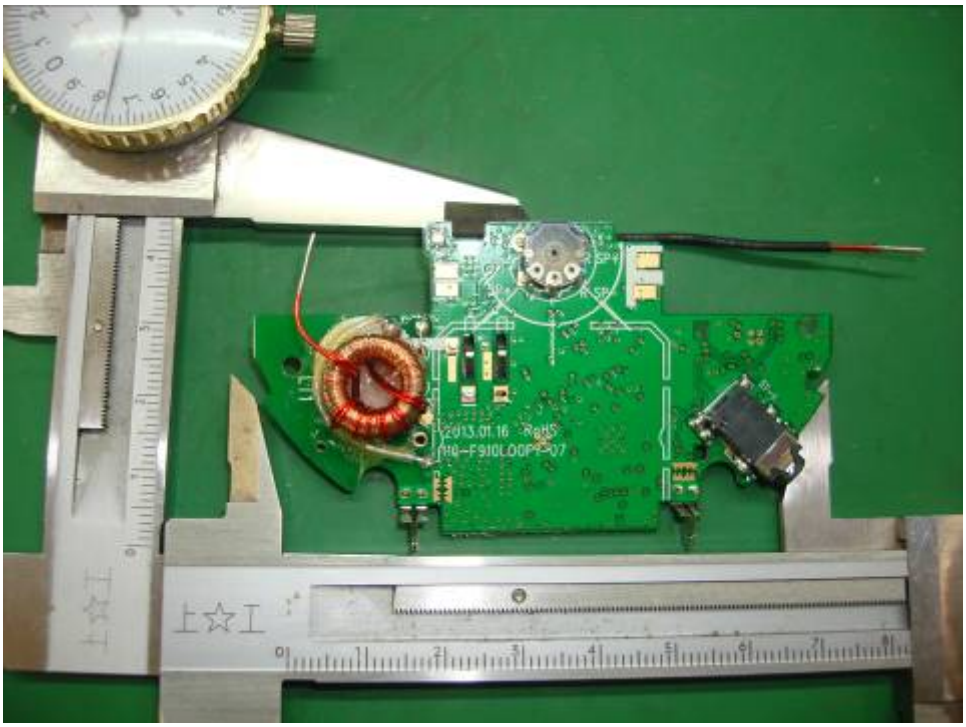

2013.01.16 RoHS

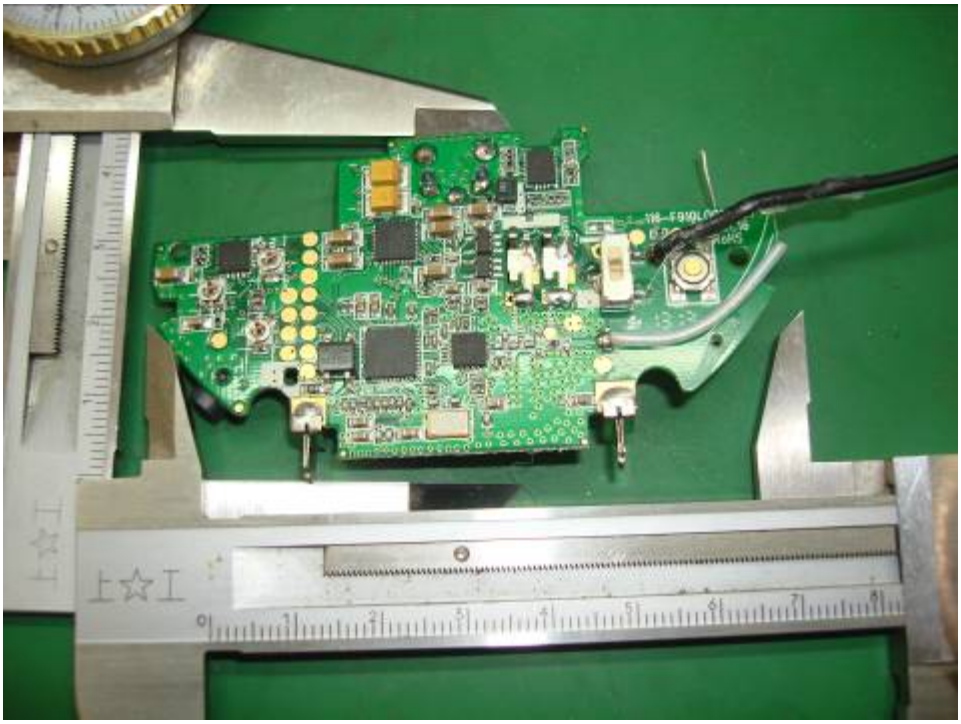


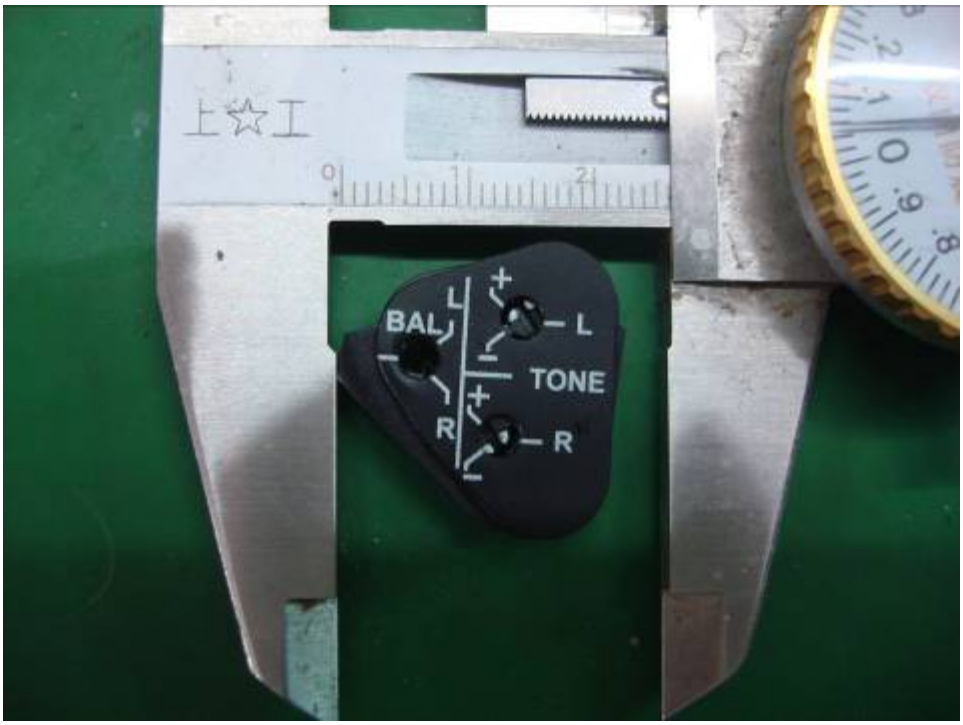











BAL
L
TONE
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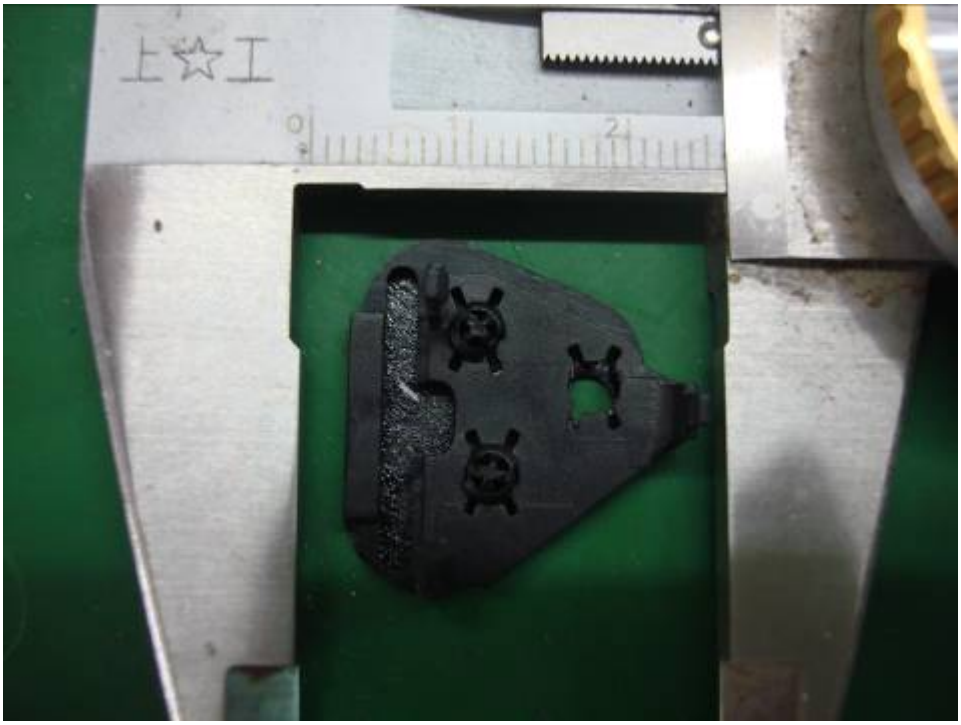
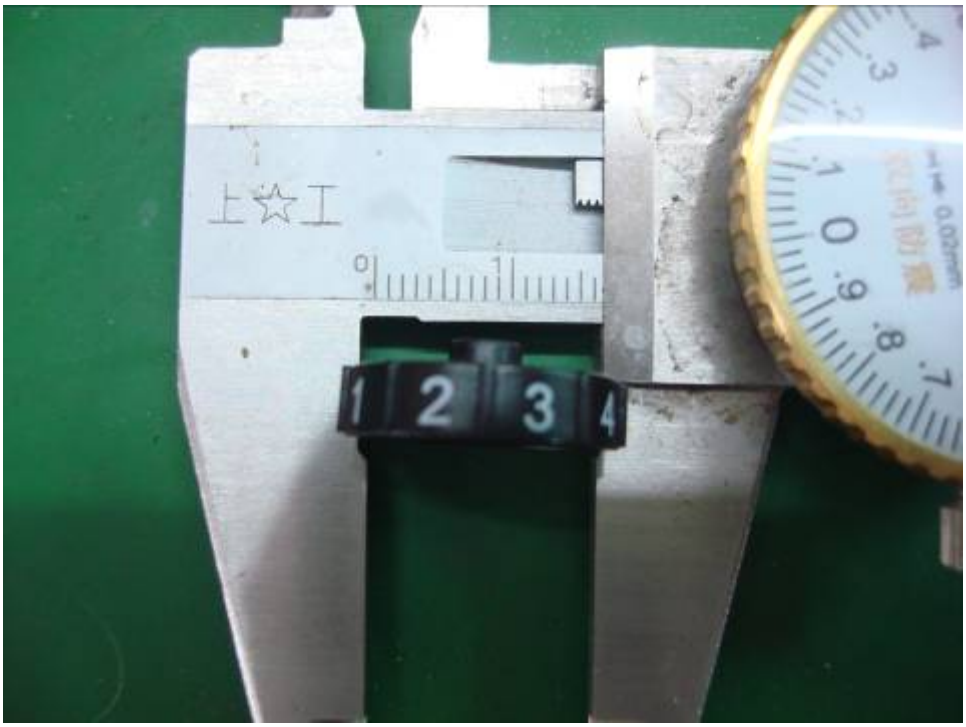
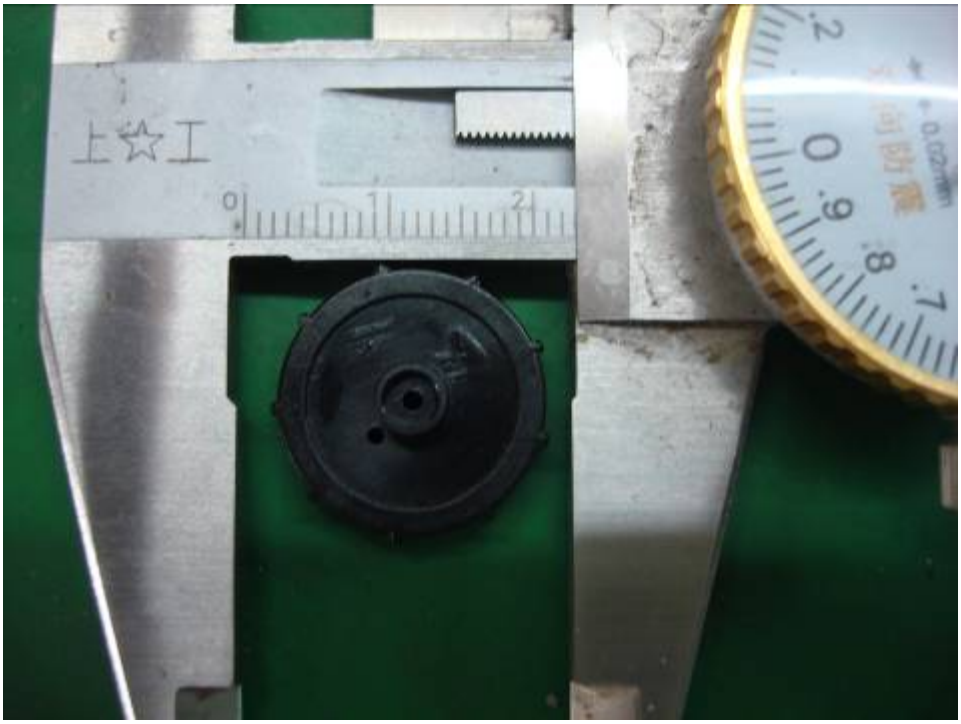
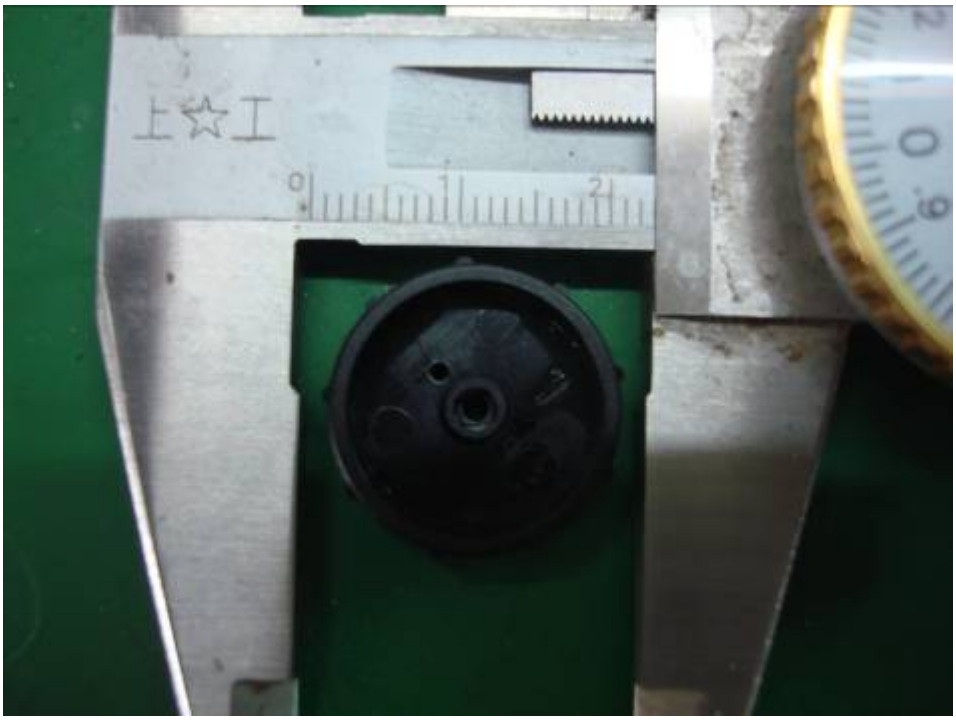
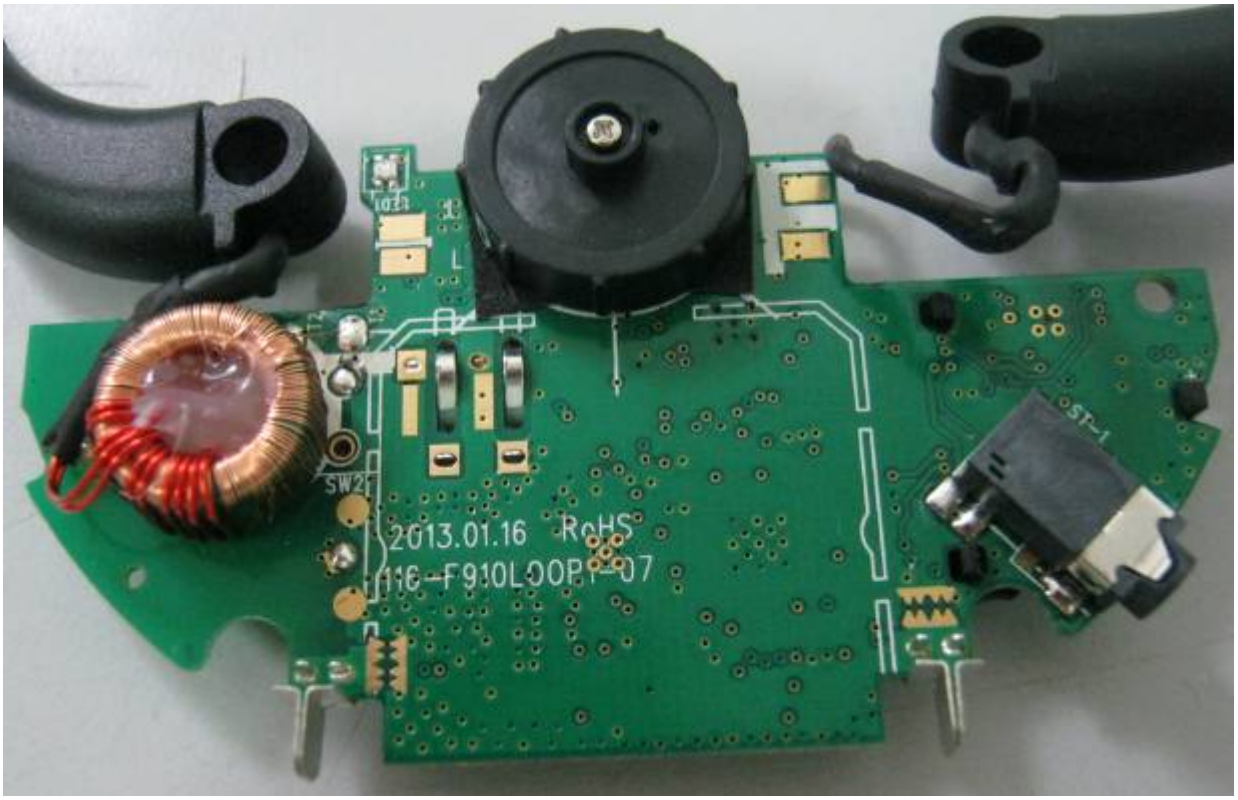



1 2 3 4






2013.01.16
RoHS


BAL
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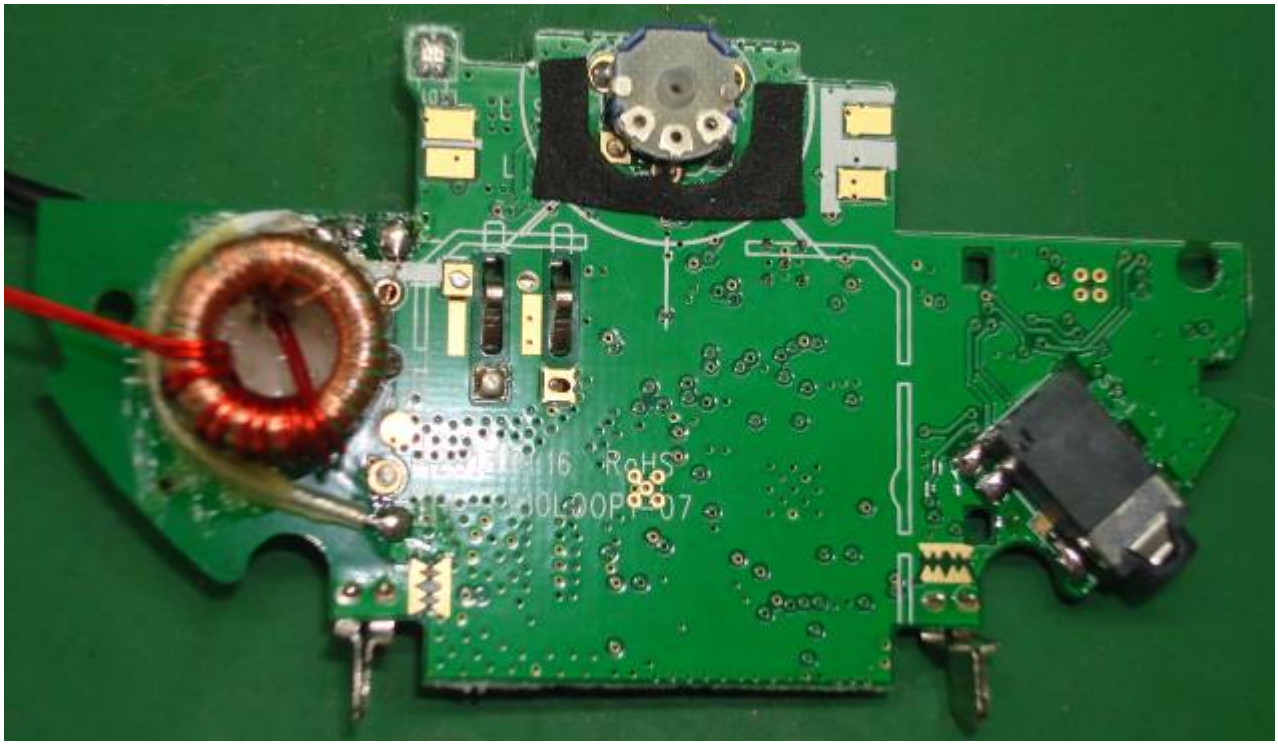
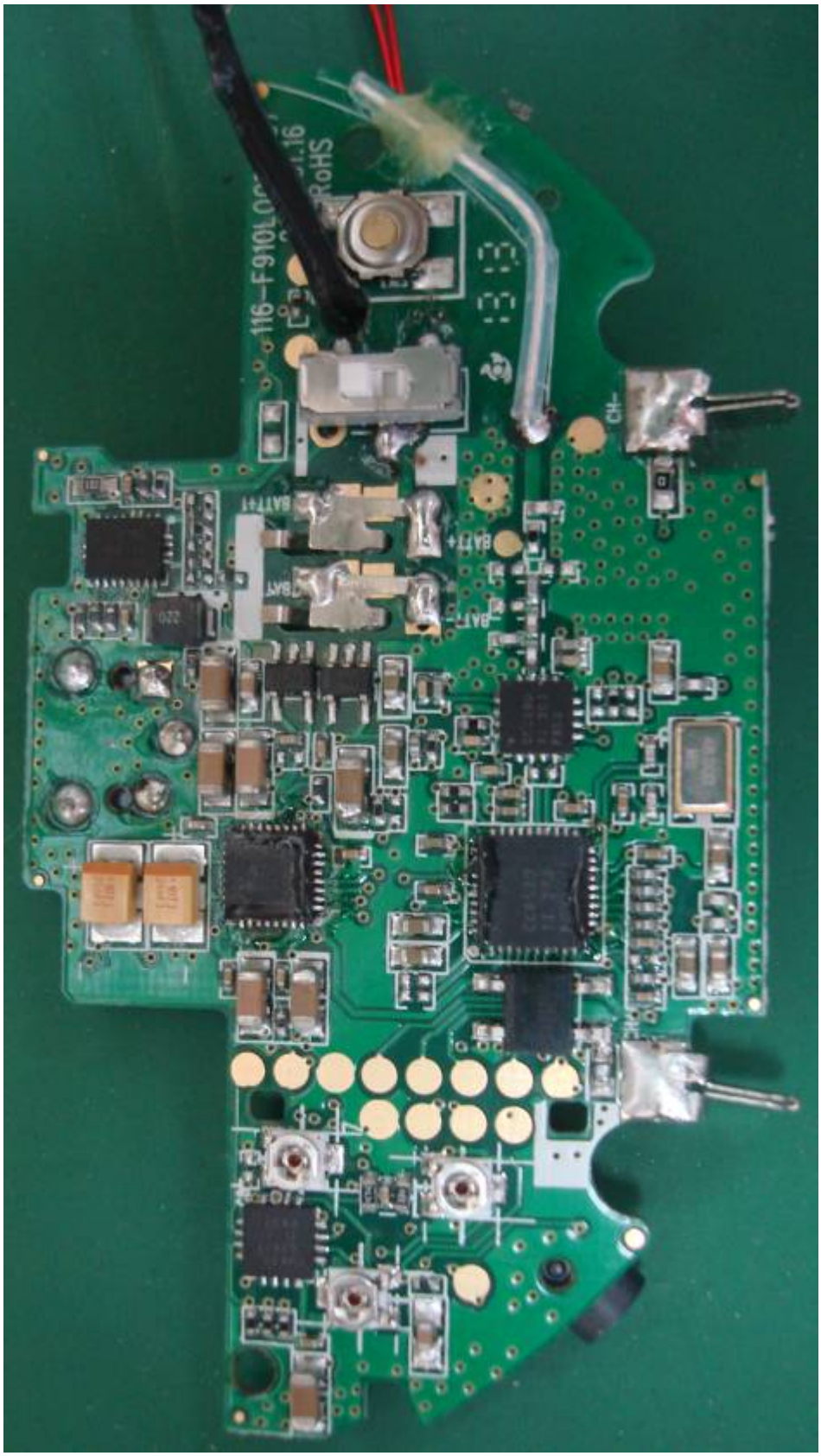
2013.01.16
RoHS

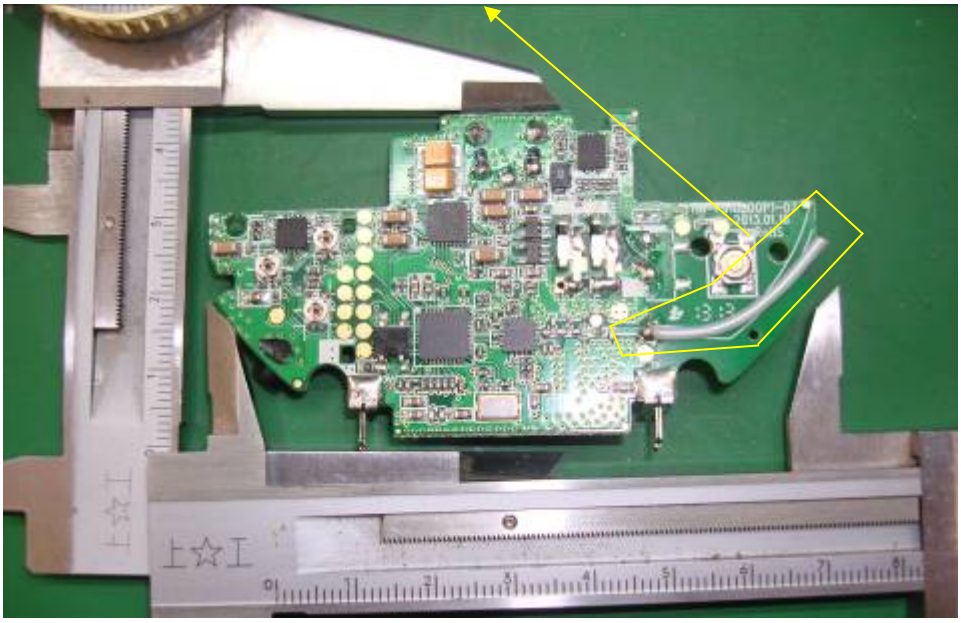

RoHS



7.3. Antenna Photo

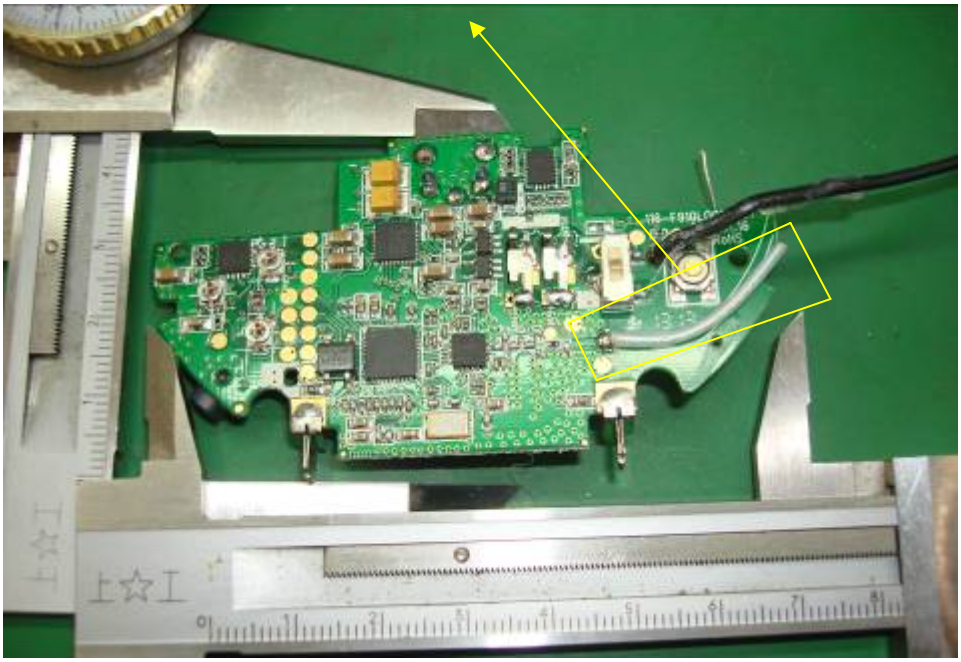
Headphone for head (headset)

Antenna



Headphone for neck

Antenna



Note:

The EUT was used permanently attached antenna, and it's complied with the requirements of section 15.203: antenna requirement.

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