

FCC PART 15.249
EMI MEASUREMENT AND TEST REPORT
For

SHENZHEN CJC-HYUNDAI ELECTRICAL CO., LTD
3rd Floor, No. 11 Building, Software Park, Nanshan District, Shenzhen, China

FCC ID: 2AAAU-I300

May 02, 2013

This Report Concerns: Original Report	Equipment Type: Bluetooth Portable Speakers
Test Engineer:	Anna Lv <i>Anna Lv</i>
Report No.:	BST11041095ER-3
Receive EUT Date/Test Date:	April 19, 2013 / April 19, 2013 - May 02, 2013
Reviewed By:	Mike Moo <i>Mike Moo</i>
Prepared By:	Shenzhen BST Technology Co.,Ltd. 3F,Weames Technology Building, No. 10 Kefa Road, Science Park, Nanshan District,Shenzhen,Guangdong,China Tel: 0755-26747751-3 Fax: 0755-26747751-3 ext.826

Note: The test report is specially limited to the above company and this particular sample only. It may not be duplicated without prior written consent of Shenzhen BST Technology Co.,Ltd. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the US Government.

2 Contents

	Page
1 COVER PAGE.....	1
2 CONTENTS	2
3 TEST SUMMARY	3
4 GENERAL INFORMATION	4
4.1 CLIENT INFORMATION	4
4.2 GENERAL DESCRIPTION OF EUT	4
4.3 TEST MODE	6
4.4 DESCRIPTION OF SUPPORT UNITS	6
4.5 TEST FACILITY.....	6
4.6 TEST LOCATION	6
4.7 OTHER INFORMATION REQUESTED BY THE CUSTOMER.....	6
5 TEST INSTRUMENTS LIST	7
6 TEST RESULTS AND MEASUREMENT DATA.....	8
6.1 ANTENNA REQUIREMENT:.....	8
6.2 CONDUCTED EMISSIONS	9
6.3 RADIATED EMISSION METHOD	12
6.3.1 <i>Field Strength of The Fundamental Signal</i>	14
6.3.2 <i>Spurious emissions</i>	15
6.3.3 <i>Bandedge emissions</i>	19
6.4 20dB OCCUPY BANDWIDTH	20
7 TEST SETUP PHOTO	22
8 EUT CONSTRUCTIONAL DETAILS	24

3 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
AC Power Line Conducted Emission	15.207	Pass
Field strength of the fundamental signal	15.249 (a)	Pass
Spurious emissions	15.249 (a) (d)/15.209	Pass
Band edge	15.249 (d)/15.205	Pass
20dB Occupied Bandwidth	15.215 (c)	Pass

Pass: The EUT complies with the essential requirements in the standard.

N/A: not applicable.

4 General Information

4.1 Client Information

Applicant:	SHENZHEN CJC-HYUNDAI ELECTRICAL CO., LTD
Address of Applicant:	3rd Floor, No. 11 Building, Software Park, Nanshan District, Shenzhen, China
Manufacturer:	Huizhou CJC-Hyundai Electronic Co., Ltd
Address of Manufacturer:	CJC Industrial Park, Pingtan Town, Huiyang District, Huizhou China

4.2 General Description of EUT

Product Name:	Bluetooth Portable Speakers
Model No.:	i300, i80, i70, i200
Trade name:	HYUNDAI
Test Model No.:	i300
<i>Remark:</i>	<i>i300, i80, i70 and i200 are identical in the same PCB layout, interior structure and electrical circuits. The only differences are the appearance color and model name for commercial purpose.</i>
Operation Frequency:	2402MHz~2480MHz
Channel numbers:	79
Channel separation:	1MHz
Modulation type:	GFSK
Antenna Type:	PCB Antenna
Antenna gain:	2dBi
Power supply:	DC 3.7V Li-ion Battery

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402MHz	21	2422MHz	41	2442MHz	61	2462MHz
2	2403MHz	22	2423MHz	42	2443MHz	62	2463MHz
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
19	2420MHz	39	2440MHz	59	2460MHz	79	2480MHz
20	2421MHz	34	2441MHz	60	2461MHz		

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The lowest channel	2402MHz
The middle channel	2441MHz
The Highest channel	2480MHz

4.3 Test mode

Charging and Bluetooth mode	Keep the EUT in playing music by bluetooth and in charging mode.
Transmitting mode	Keep the EUT in continuously transmitting mode with GFSK modulation.
<i>Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.</i>	

Per-test mode.

We have verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report and defined as follows:

Axis	X	Y	Z
Field Strength(dBuV/m)	86.76	91.98	88.97

Final Test Mode:

According to ANSI C63.4 standards, the test results are both the "worst case" and "worst setup":
Y axis (see the test setup photo)

4.4 Description of Support Units

Manufacturer	Description	Model	Serial Number	FCC approval
IBM Thinkpad	Notebook PC	2374	L3-G0686	FCC Doc

4.5 Test Facility

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

- **CNAS —Registration No.: CNAS L5775**

CNAS has accredited Global United Technology Services Co., Ltd. To ISO/IEC 17025 General Requirements for the competence of testing and calibration laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **FCC —Registration No.: 600491**

Global United Technology Services Co., Ltd., Shenzhen 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 files. Registration 600491, July 20, 2010.

- **Industry Canada (IC)**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. Has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-1.

4.6 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: 2nd Floor, Block No.2, Laodong Industrial Zone, Xixiang Road Baoan District, Shenzhen, China

Tel: 0755-27798480

Fax: 0755-27798960

4.7 Other Information Requested by the Customer

None.

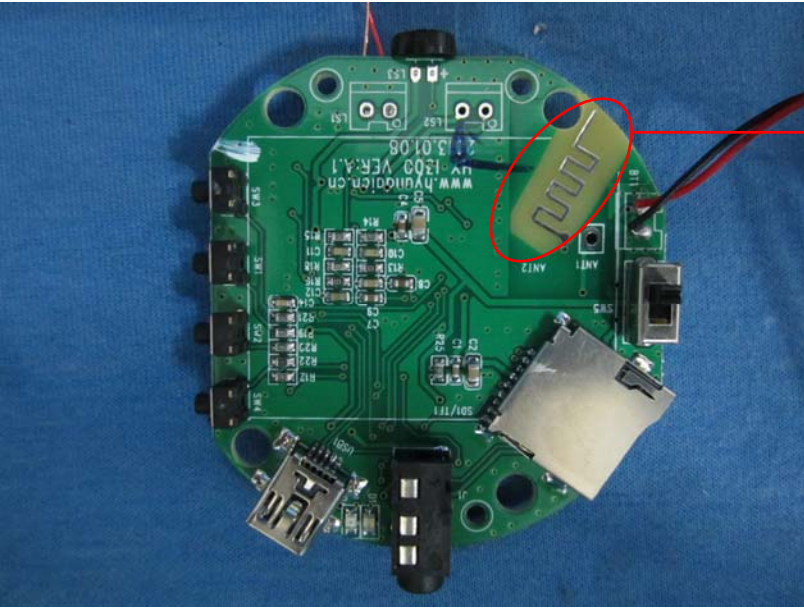
5 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	Mar. 29 2013	Mar. 28 2014
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	Spectrum Analyzer	Agilent	E4440A	GTS533	Dec. 6, 2012	Dec. 5 2013
4	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	Jul. 03 2012	Jul. 02 2013
5	Loop Antenna	ZHINAN	ZN30900A	GTS220	Feb. 24 2013	Feb. 23 2014
6	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	Feb. 24 2013	Feb. 23 2014
7	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	June 29 2012	June 28 2013
8	Horn Antenna	ETS-LINDGREN	3160	GTS217	Mar. 29 2013	Mar. 28 2014
9	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
10	Coaxial Cable	GTS	N/A	GTS213	Mar. 30 2013	Mar. 29 2014
11	Coaxial Cable	GTS	N/A	GTS211	Mar. 30 2013	Mar. 29 2014
12	Coaxial cable	GTS	N/A	GTS210	Mar. 30 2013	Mar. 29 2014
13	Coaxial Cable	GTS	N/A	GTS212	Mar. 30 2013	Mar. 29 2014
14	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	Jul. 03 2012	Jul. 02 2013
15	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	Jul. 03 2012	Jul. 02 2013
16	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June 29 2012	June 28 2013
17	Band filter	Amindeon	82346	GTS219	Mar. 30 2013	Mar. 29 2014

Conducted Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.0(L)x3.0(W)x3.0(H)	GTS264	Sep. 08 2011	Sep. 07 2013
2	EMI Test Receiver	Rohde & Schwarz	ESCS30	GTS223	Jul. 03 2012	Jul. 02 2013
3	10dB Pulse Limita	Rohde & Schwarz	N/A	GTS224	Jul. 03 2012	Jul. 02 2013
4	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	Jul. 03 2012	Jul. 02 2013
5	LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	GTS226	Jul. 03 2012	Jul. 02 2013
6	Coaxial Cable	GTS	N/A	GTS227	Jul. 03 2012	Jul. 02 2013
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A

6 Test results and Measurement Data

6.1 Antenna requirement:

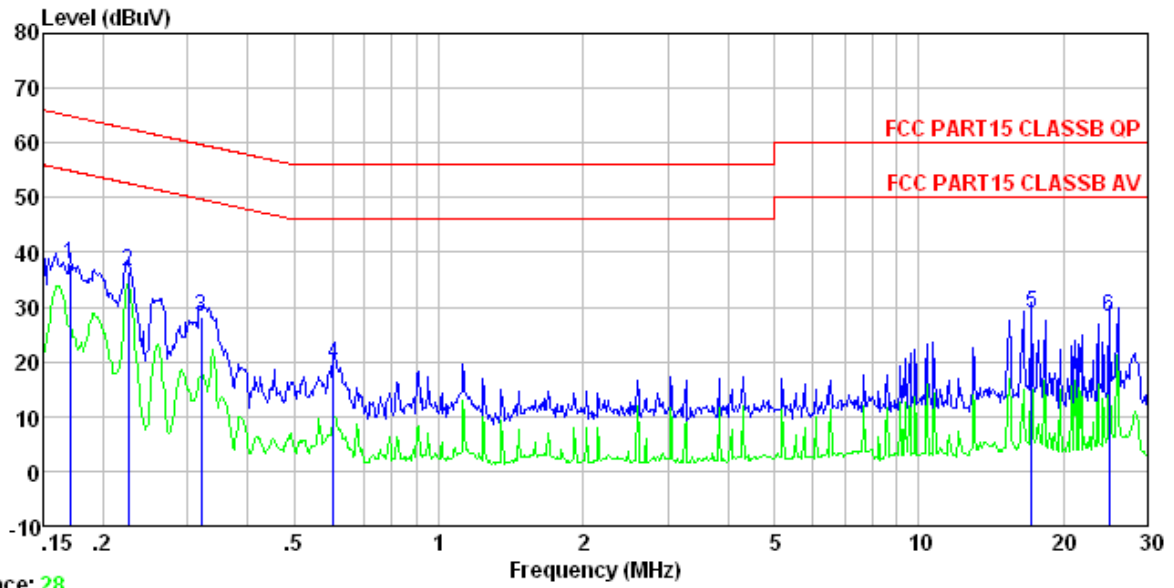
Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.	
E.U.T Antenna: <i>The antenna is PCB antenna, the best case gain of the antenna is 2dBi</i>	
 <p>The image shows a green PCB antenna with a red circle highlighting the antenna element. A red arrow points from the text 'RF Antenna' to the highlighted area. The PCB has various components, including a USB port, a micro-USB port, and a small antenna element labeled 'ANT2'.</p>	

6.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207														
Test Method:	ANSI C63.4:2003														
Test Frequency Range:	150KHz to 30MHz														
Class / Severity:	Class B														
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto														
Limit:	<table border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th> <th colspan="2">Limit (dBuV)</th> </tr> <tr> <th>Quasi-peak</th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>0.15-0.5</td> <td>66 to 56*</td> <td>56 to 46*</td> </tr> <tr> <td>0.5-5</td> <td>56</td> <td>46</td> </tr> <tr> <td>5-30</td> <td>60</td> <td>50</td> </tr> </tbody> </table> <p>* Decreases with the logarithm of the frequency.</p>	Frequency range (MHz)	Limit (dBuV)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	5-30	60	50
Frequency range (MHz)	Limit (dBuV)														
	Quasi-peak	Average													
0.15-0.5	66 to 56*	56 to 46*													
0.5-5	56	46													
5-30	60	50													
Test setup:	<p>The diagram illustrates the test setup. A horizontal line at the top represents the Reference Plane. Below it, on the left, is a box containing 'AUX Equipment' and 'E.U.T' (Equipment Under Test) connected to a 'LISN' (Line Impedance Stabilization Network). The distance from the Reference Plane to the LISN is 40cm. On the right, another 'LISN' is connected to 'AC power' through a 'Filter'. The distance from the Reference Plane to this LISN is 80cm. An 'EMI Receiver' is connected to the second LISN. The entire setup is on a 'Test table/Insulation plane'.</p> <p><i>Remark</i> <i>E.U.T: Equipment Under Test</i> <i>LISN: Line Impedance Stabilization Network</i> <i>Test table height=0.8m</i></p>														
Test procedure:	<ol style="list-style-type: none"> 1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement. 														
Test Instruments:	Refer to section 6.0 for details														
Test mode:	Charging and Bluetooth mode														
Test results:	Pass														

Measurement data:

Line:

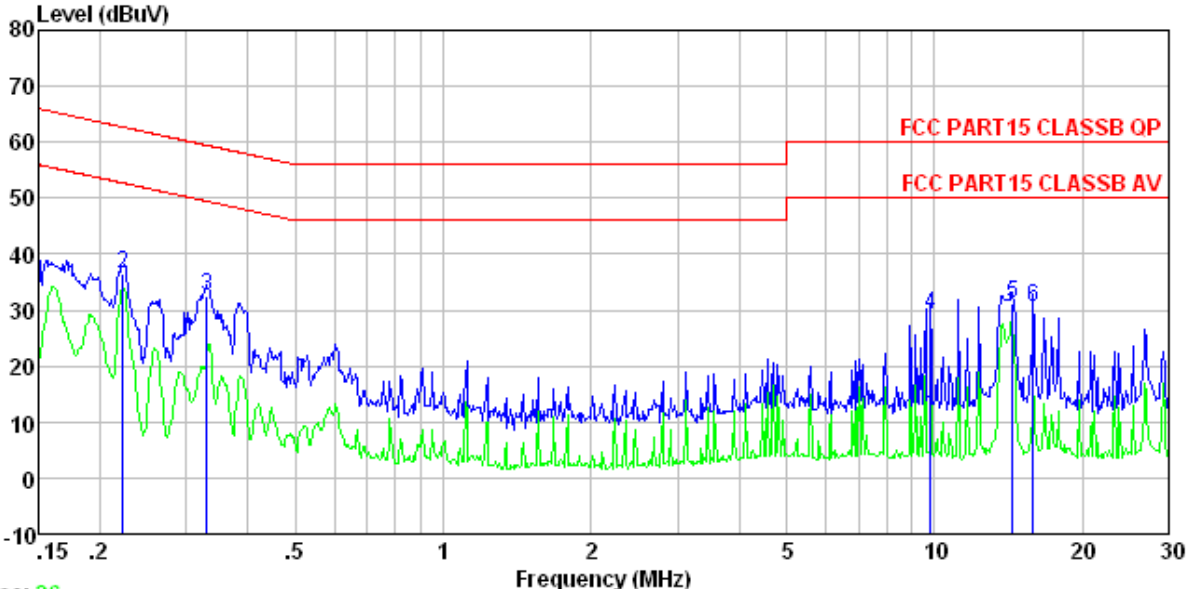


Trace: 28

Condition : FCC PART15 CLASSB QP LISN-2012 LINE
 Job No. : 0487RF
 Test mode : Charging and Bluetooth mode
 Test Engineer: Jim

	Read Freq	LISN Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.170	38.11	-0.26	0.10	37.95	64.94	-26.99	QP
2	0.226	36.50	-0.23	0.10	36.37	62.61	-26.24	QP
3	0.320	28.46	-0.22	0.10	28.34	59.71	-31.37	QP
4	0.604	19.66	-0.20	0.10	19.56	56.00	-36.44	QP
5	17.199	29.21	-0.56	0.20	28.85	60.00	-31.15	QP
6	24.922	28.94	-0.83	0.21	28.32	60.00	-31.68	QP

Neutral:



Trace: 26

Condition : FCC PART15 CLASSB QP LISN-2012 NEUTRAL
 Job No. : 0487RF
 Test mode : Charging and Bluetooth mode
 Test Engineer: Jim

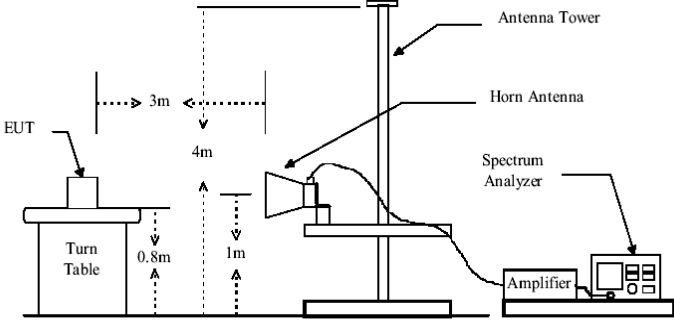
	Read Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.150	38.17	-0.13	0.10	38.14	66.00	-27.86	QP
2	0.223	36.52	-0.09	0.10	36.53	62.70	-26.17	QP
3	0.330	32.43	-0.09	0.10	32.44	59.44	-27.00	QP
4	9.809	29.17	-0.29	0.20	29.08	60.00	-30.92	QP
5	14.440	31.43	-0.40	0.20	31.23	60.00	-28.77	QP
6	15.885	30.90	-0.42	0.20	30.68	60.00	-29.32	QP

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss
4. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

6.3 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209				
Test Method:	ANSI C63.4:2003				
Test Frequency Range:	9kHz to 25GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Value
	9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
	150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
Peak		1MHz	10Hz	Average	
Limit: (Field strength of the fundamental signal)	Frequency	Limit (dBuV/m @3m)		Remark	
	2400MHz-2483.5MHz	94.00		Average Value	
		114.00		Peak Value	
Limit: (Spurious Emissions)	Frequency	Limit (uV/m)	Value	Measurement Distance	
	0.009MHz-1.705MHz	2400/F(KHz)	QP	300m	
	0.490MHz-1.705MHz	24000/F(KHz)	QP	300m	
	1.705MHz-30MHz	30	QP	30m	
	30MHz-88MHz	100	QP	3m	
	88MHz-216MHz	150	QP		
	216MHz-960MHz	200	QP		
	960MHz-1GHz	500	QP		
	Above 1GHz	500	Average		
		5000	Peak		
Limit: (band edge)	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.				
Test setup:	<p>Below 1GHz</p> <p>Above 1GHz</p>				

	
<p>Test Procedure:</p>	<ol style="list-style-type: none"> 1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
<p>Test Instruments:</p>	<p>Refer to section 6.0 for details</p>
<p>Test mode:</p>	<p>Refer to section 5.3 for details</p>
<p>Test results:</p>	<p>Pass</p>

Measurement data:

Remark: The measured signal level of frequency below 30MHz are attenuated more than 20 dB below the limits, so the data not exhibited in the report.

6.3.1 Field Strength of The Fundamental Signal

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2402.00	88.12	27.58	5.39	30.18	90.91	114.00	-23.09	Horizontal
2402.00	86.61	27.58	5.39	30.18	89.40	114.00	-24.60	Vertical
2441.00	87.12	27.55	5.43	30.06	90.04	114.00	-23.96	Horizontal
2441.00	85.88	27.55	5.43	30.06	88.80	114.00	-25.20	Vertical
2480.00	88.92	27.52	5.47	29.93	91.98	114.00	-22.02	Horizontal
2480.00	86.44	27.52	5.47	29.93	89.50	114.00	-24.50	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2402.00	77.77	27.58	5.39	30.18	80.56	94.00	-13.44	Horizontal
2402.00	76.21	27.58	5.39	30.18	79.00	94.00	-15.00	Vertical
2441.00	76.54	27.55	5.43	30.06	79.46	94.00	-14.54	Horizontal
2441.00	74.09	27.55	5.43	30.06	77.01	94.00	-16.99	Vertical
2480.00	78.56	27.52	5.47	29.93	81.62	94.00	-12.38	Horizontal
2480.00	76.08	27.52	5.47	29.93	79.14	94.00	-14.86	Vertical

6.3.2 Spurious emissions

■ Below 1GHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
36.90	38.40	16.20	0.63	32.06	23.17	40.00	-16.83	Vertical
49.88	38.49	16.37	0.77	31.96	23.67	40.00	-16.33	Vertical
91.82	37.28	15.53	1.12	31.73	22.20	43.50	-21.30	Vertical
238.31	38.35	15.04	2.06	32.16	23.29	46.00	-22.71	Vertical
370.70	39.87	16.51	2.72	31.97	27.13	46.00	-18.87	Vertical
485.61	40.01	18.29	3.24	31.60	29.94	46.00	-16.06	Vertical
38.89	37.72	16.55	0.65	32.06	22.86	40.00	-17.14	Horizontal
54.26	37.52	16.14	0.81	31.95	22.52	40.00	-17.48	Horizontal
96.10	37.03	15.99	1.16	31.75	22.43	43.50	-21.07	Horizontal
243.38	38.94	15.09	2.09	32.16	23.96	46.00	-22.04	Horizontal
385.28	37.62	16.78	2.79	31.93	25.26	46.00	-20.74	Horizontal
576.64	36.91	20.09	3.63	31.15	29.48	46.00	-16.52	Horizontal

■ Above 1GHz

Test channel:	Lowest channel
---------------	----------------

Peak value:

Frequency (MHz)	Read Level (dBUV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBUV/m)	Limit Line (dBUV/m)	Over Limit (dB)	polarization
4804.00	34.62	31.78	8.60	24.17	50.83	74.00	-23.17	Vertical
7206.00	33.17	36.15	11.65	26.39	54.58	74.00	-19.42	Vertical
9608.00	30.11	38.01	14.14	25.45	56.81	74.00	-17.19	Vertical
12010.00	*					74.00		Vertical
14412.00	*					74.00		Vertical
4804.00	30.03	31.78	8.60	24.17	46.24	74.00	-27.76	Horizontal
7206.00	30.38	36.15	11.65	26.39	51.79	74.00	-22.21	Horizontal
9608.00	25.82	38.01	14.14	25.45	52.52	74.00	-21.48	Horizontal
12010.00	*					74.00		Horizontal
14412.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBUV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBUV/m)	Limit Line (dBUV/m)	Over Limit (dB)	polarization
4804.00	22.91	31.78	8.60	24.17	39.12	54.00	-14.88	Vertical
7206.00	21.34	36.15	11.65	26.39	42.75	54.00	-11.25	Vertical
9608.00	18.57	38.01	14.14	25.45	45.27	54.00	-8.73	Vertical
12010.00	*					54.00		Vertical
14412.00	*					54.00		Vertical
4804.00	18.14	31.78	8.60	24.17	34.35	54.00	-19.65	Horizontal
7206.00	17.65	36.15	11.65	26.39	39.06	54.00	-14.94	Horizontal
9608.00	15.96	38.01	14.14	25.45	42.66	54.00	-11.34	Horizontal
12010.00	*					54.00		Horizontal
14412.00	*					54.00		Horizontal

Remark:

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
3. *“*”, means this data is the too weak instrument of signal is unable to test.*

Test channel:	Middle channel
---------------	----------------

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4882.00	35.07	31.85	8.66	24.10	51.48	74.00	-22.52	Vertical
7323.00	34.35	36.37	11.72	26.71	55.73	74.00	-18.27	Vertical
9764.00	29.53	38.35	14.25	25.36	56.77	74.00	-17.23	Vertical
12205.00	*					74.00		Vertical
14646.00	*					74.00		Vertical
4882.00	30.67	31.85	8.66	24.10	47.08	74.00	-26.92	Horizontal
7323.00	29.48	36.37	11.72	26.71	50.86	74.00	-23.14	Horizontal
9764.00	24.84	38.35	14.25	25.36	52.08	74.00	-21.92	Horizontal
12205.00	*					74.00		Horizontal
14646.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4882.00	23.36	31.85	8.66	24.10	39.77	54.00	-14.23	Vertical
7323.00	21.41	36.37	11.72	26.71	42.79	54.00	-11.21	Vertical
9764.00	18.81	37.21	14.25	25.36	44.91	54.00	-9.09	Vertical
12205.00	*					54.00		Vertical
14646.00	*					54.00		Vertical
4882.00	18.78	31.85	8.66	24.10	35.19	54.00	-18.81	Horizontal
7323.00	17.72	36.37	11.72	26.71	39.10	54.00	-14.90	Horizontal
9764.00	15.26	38.35	14.25	25.36	42.50	54.00	-11.50	Horizontal
12205.00	*					54.00		Horizontal
14646.00	*					54.00		Horizontal

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Pre-amplifier Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.
3. “*”, means this data is the too weak instrument of signal is unable to test.

Test channel:	Highest channel
---------------	-----------------

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4960.00	33.88	31.93	8.73	24.03	50.51	74.00	-23.49	Vertical
7440.00	33.37	36.59	11.79	27.03	54.72	74.00	-19.28	Vertical
9920.00	27.06	38.81	14.38	25.26	54.99	74.00	-19.01	Vertical
12400.00	*					74.00		Vertical
14880.00	*					74.00		Vertical
4960.00	30.27	31.93	8.73	24.03	46.90	74.00	-27.10	Horizontal
7440.00	29.69	36.59	11.79	27.03	51.04	74.00	-22.96	Horizontal
9920.00	23.38	38.81	14.38	25.26	51.31	74.00	-22.69	Horizontal
12400.00	*					74.00		Horizontal
14880.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4960.00	22.17	31.93	8.73	24.03	38.80	54.00	-15.20	Vertical
7440.00	21.96	36.59	11.79	27.03	43.31	54.00	-10.69	Vertical
9920.00	16.03	38.81	14.38	25.26	43.96	54.00	-10.04	Vertical
12400.00	*					54.00		Vertical
14880.00	*					54.00		Vertical
4960.00	18.38	31.93	8.73	24.03	35.01	54.00	-18.99	Horizontal
7440.00	18.33	36.59	11.79	27.03	39.68	54.00	-14.32	Horizontal
9920.00	13.65	38.81	14.38	25.26	41.58	54.00	-12.42	Horizontal
12400.00	*					54.00		Horizontal
14880.00	*					54.00		Horizontal

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Pre-amplifier Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.
3. “*”, means this data is the too weak instrument of signal is unable to test.

6.3.3 Bandedge emissions

All of the restriction bands were tested, and only the data of worst case was exhibited.

Test channel:	Lowest channel
---------------	----------------

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	42.78	27.59	5.38	30.18	45.57	74.00	-28.43	Horizontal
2400.00	60.28	27.58	5.39	30.18	63.07	74.00	-10.93	Horizontal
2390.00	44.17	27.59	5.38	30.18	46.96	74.00	-27.04	Vertical
2400.00	63.25	27.58	5.39	30.18	66.04	74.00	-7.96	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	32.23	27.59	5.38	30.18	35.02	54.00	-18.98	Horizontal
2400.00	44.09	27.58	5.39	30.18	46.88	54.00	-7.12	Horizontal
2390.00	32.63	27.59	5.38	30.18	35.42	54.00	-18.58	Vertical
2400.00	46.49	27.58	5.39	30.18	49.28	54.00	-4.72	Vertical

Test channel:	Highest channel
---------------	-----------------

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	46.94	27.53	5.47	29.93	50.01	74.00	-23.99	Horizontal
2500.00	45.79	27.55	5.49	29.93	48.90	74.00	-25.10	Horizontal
2483.50	45.68	27.53	5.47	29.93	48.75	74.00	-25.25	Vertical
2500.00	44.48	27.55	5.49	29.93	47.59	74.00	-26.41	Vertical

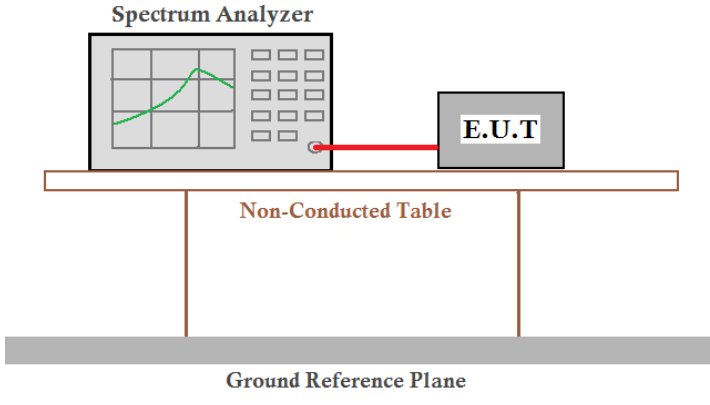
Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	37.49	27.53	5.47	29.93	40.56	54.00	-13.44	Horizontal
2500.00	33.68	27.55	5.49	29.93	36.79	54.00	-17.21	Horizontal
2483.50	35.40	27.53	5.47	29.93	38.47	54.00	-15.53	Vertical
2500.00	33.17	27.55	5.49	29.93	36.28	54.00	-17.72	Vertical

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

6.4 20dB Occupy Bandwidth

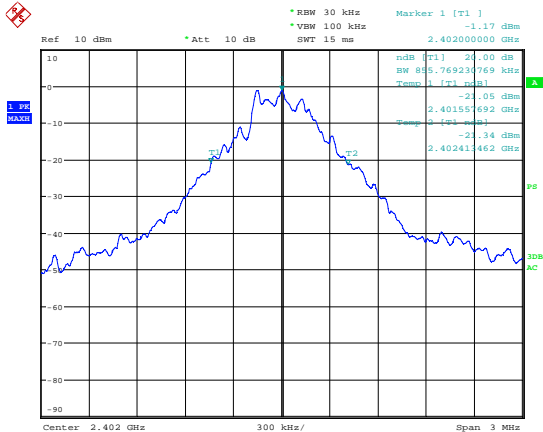
Test Requirement:	FCC Part15 C Section 15.249/15.215
Test Method:	ANSI C63.4:2003
Limit:	Operation Frequency range 2400MHz~2483.5MHz
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected via a red cable to an E.U.T. (Equipment Under Test). Both are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.</p>
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement Data

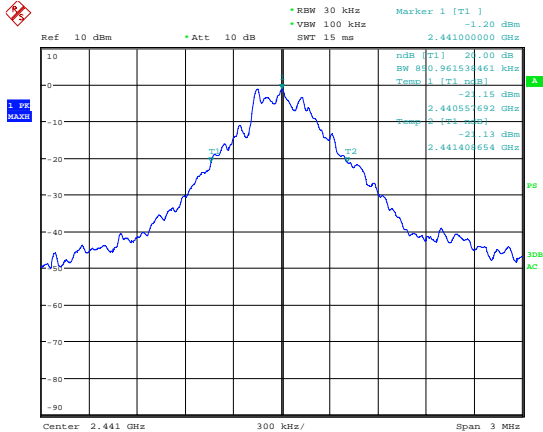
Worst case GFSK modulation

Test channel	20dB bandwidth(MHz)	Result
Lowest	0.856	Pass
Middle	0.851	Pass
Highest	0.841	Pass

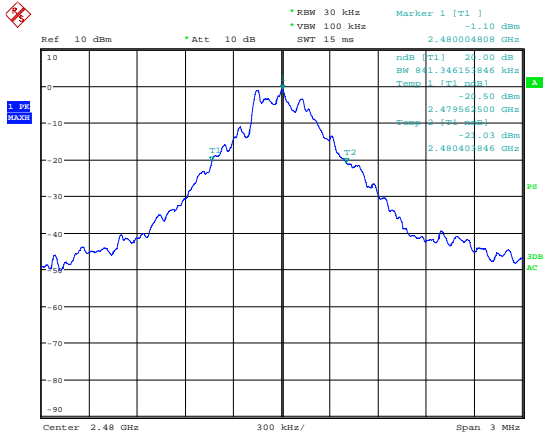
Test plot as follows:



Lowest channel



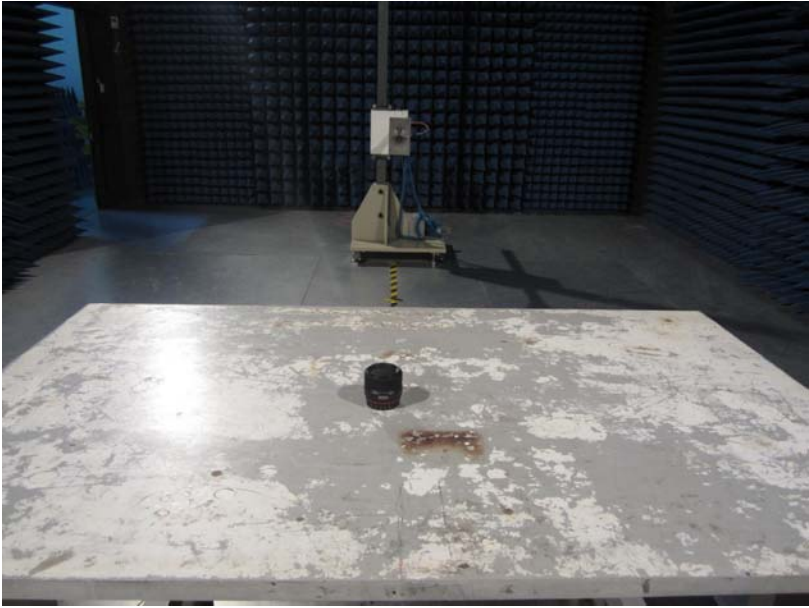
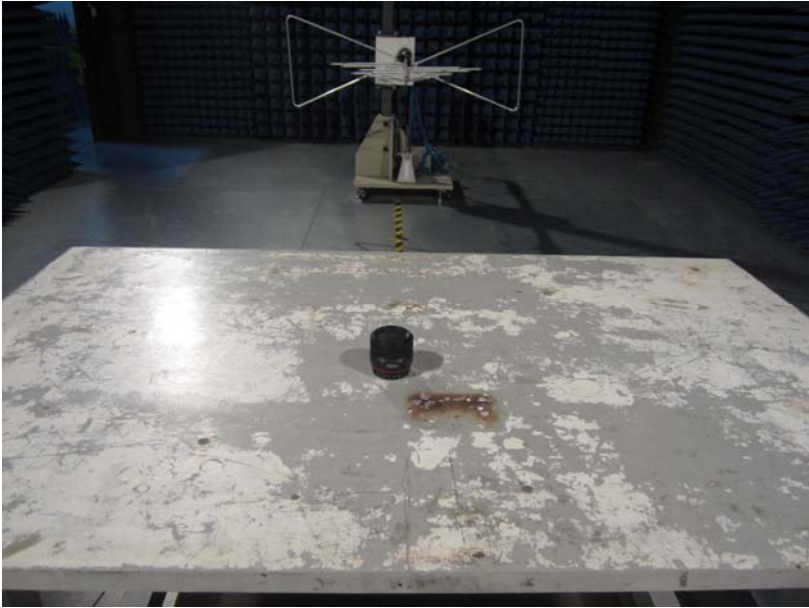
Middle channel



Highest channel

7 Test Setup Photo

Radiated Emission



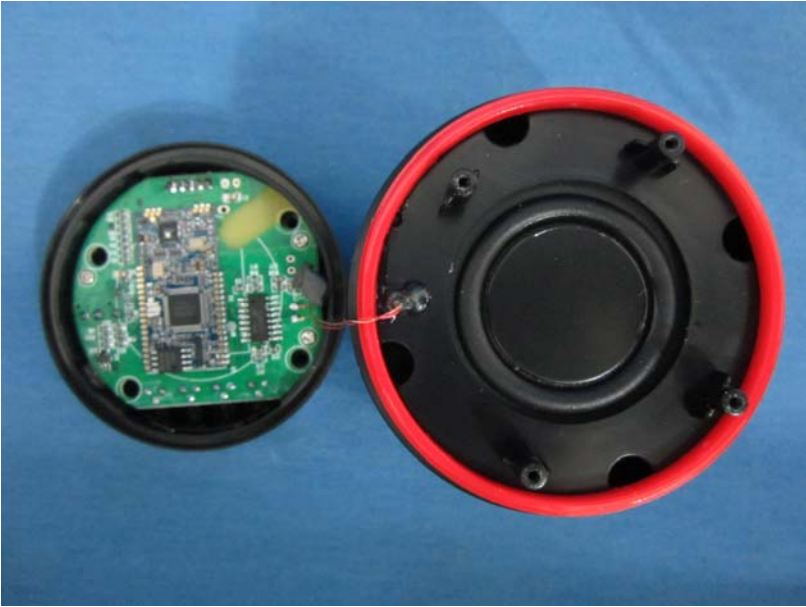
Conducted Emission

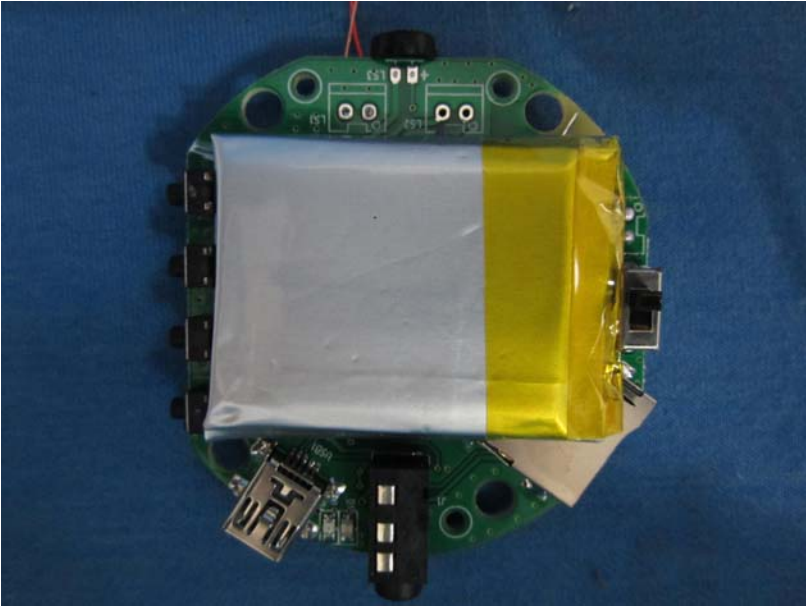
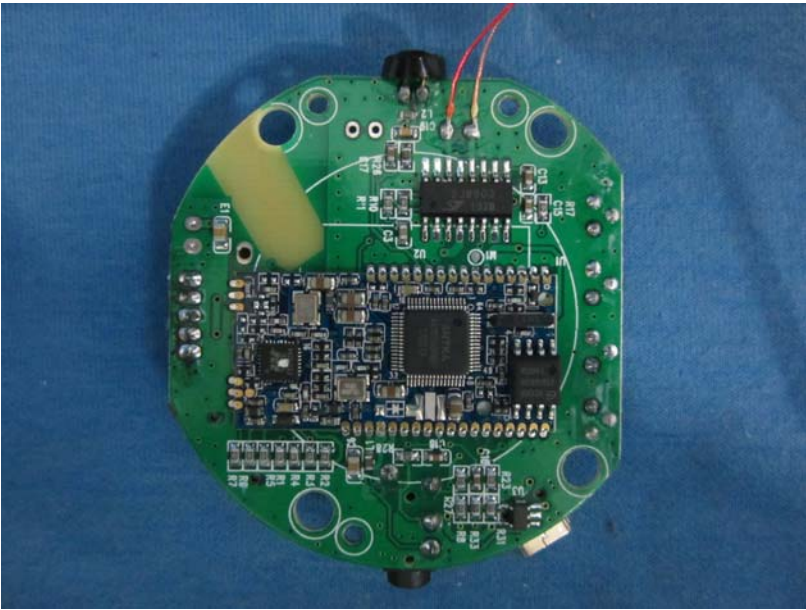


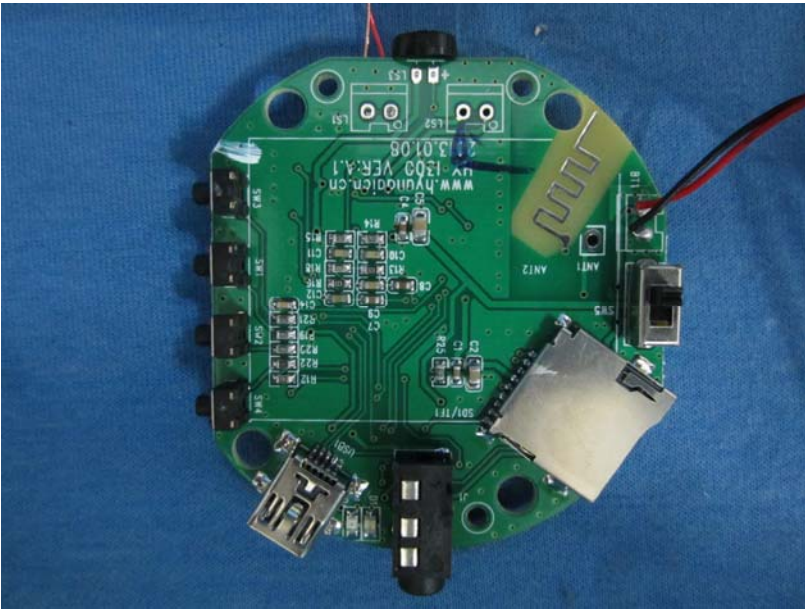
8 EUT Constructional Details











-----end-----