

FCC REPORT

Applicant: E-CORE TECHNOLOGY (HUBEI) CO., LTD

Address of Applicant: Bingang East Road, North, Huahu Development Zone, Ezhou City, Hubei Province, China

Equipment Under Test (EUT)

Product Name: 2.4GHz Universal Wireless Music Kit

Model No.: HL2608

FCC ID: BTO-HL2608

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.249:2010

Date of sample receipt: Apr. 21, 2012

Date of Test: Aug. 03, 2012

Date of report issued: Aug. 06, 2012

Test Result : PASS *

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

Authorized Signature:



Robinson Lo
Laboratory Manager

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 and does not permit the use of the GTS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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2 Version

Version No.	Date	Description
00	Aug. 06, 2012	Original

Prepared By:

Oscar. Li

Date:

Aug. 06, 2012

Project Engineer

Check By:

Hans. Hu

Date:

Aug. 06, 2012

Reviewer

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4 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.

5 General Information

5.1 Client Information

Applicant:	E-CORE TECHNOLOGY (HUBEI) CO., LTD
Address of Applicant:	Bingang East Road, North, Huahu Development Zone, Ezhou City, Hubei Province, China
Manufacturer:	E-CORE TECHNOLOGY (HUBEI) CO., LTD
Address of Manufacturer/	Bingang East Road, North, Huahu Development Zone, Ezhou City, Hubei Province, China

5.2 General Description of E.U.T.

Product Name:	2.4GHz Universal Wireless Music Kit
Model No.:	HL2608
Operation Frequency:	2406MHz~2476MHz
Modulation type:	GFSK
Antenna Type:	Integral
Antenna gain:	2dBi
Power supply:	DC 3.7V by battery

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	2406MHz
The middle channel	2440MHz
The Highest channel	2476MHz

5.3 Test mode

Transmitting mode	Keep the EUT in transmitting mode.
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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)	97.36	99.48	98.55

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)

5.4 Description of Support Units

Manufacturer	Description	Model	Serial Number	FCC ID/DoC
IBM	Notebook	T42	GTS209	DoC
IBM	AC Adapter	92P1024	N/A	DoC

5.5 Test Facility

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

• 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 our 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.

5.6 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

5.7 Other Information Requested by the Customer

None.

5.8 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. 30 2011	Mar. 29 2013
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	Jul. 03 2012	Jul. 02 2013
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	Feb. 25 2012	Feb. 24 2013
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	June 29 2012	June 28 2013
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	Mar. 30 2011	Mar. 29 2013
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	Mar. 31 2012	Mar. 30 2013
9	Coaxial Cable	GTS	N/A	GTS211	Mar. 31 2012	Mar. 30 2013
10	Coaxial cable	GTS	N/A	GTS210	Mar. 31 2012	Mar. 30 2013
11	Coaxial Cable	GTS	N/A	GTS212	Mar. 31 2012	Mar. 30 2013
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	Jul. 03 2012	Jul. 02 2013
13	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	Jul. 03 2012	Jul. 02 2013
14	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June 29 2012	June 28 2013
15	Band filter	Amindeon	82346	GTS219	Mar. 31 2012	Mar. 30 2013
16	Universal radio communication tester	Rohde & Schwarz	CMU200	GTS235	May 10 2012	May 09 2013
17	Signal Generator	Rohde & Schwarz	SML03	GTS236	May 10 2012	May 09 2013
18	Temp. Humidity/ Barometer	Oregon Scientific	BA-888	GTS248	May 10 2012	May 09 2013
19	D.C. Power Supply	Instek	PS-3030	GTS232	NA	NA
20	Splitter	Agilent	11636B	GTS237	May 10 2012	May 09 2013

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)	GTS252	Jul. 03 2012	Jul. 02 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	LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	GTS226	Jul. 03 2012	Jul. 02 2013
5	Coaxial Cable	GTS	N/A	GTS227	Mar. 31 2012	Mar. 30 2013
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A

6 Test results and Measurement Data

6.1 Antenna requirement:

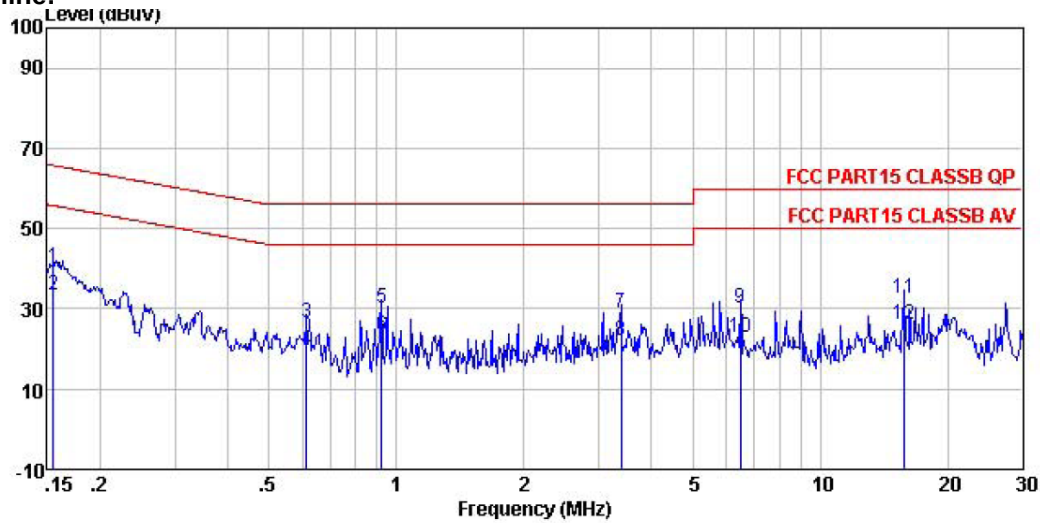
Standard requirement:	FCC Part15 C Section 15.203 /247(c)
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique 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 integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 2dBi.</i>	
	

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><tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBuV)</th></tr><tr><th>Quasi-peak</th><th>Average</th></tr><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></table> * Decreases with the logarithm of the frequency.			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 procedure	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network(L.I.S.N.). The provide 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 refers 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: 2009 on conducted measurement.																
Test setup:	Reference Plane Test table/Insulation plane <i>Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</i>																
Test Instruments:	Refer to section 5.8 for details																
Test mode:	Refer to section 5.3 for details																
Test results:	Pass																

Measurement Data

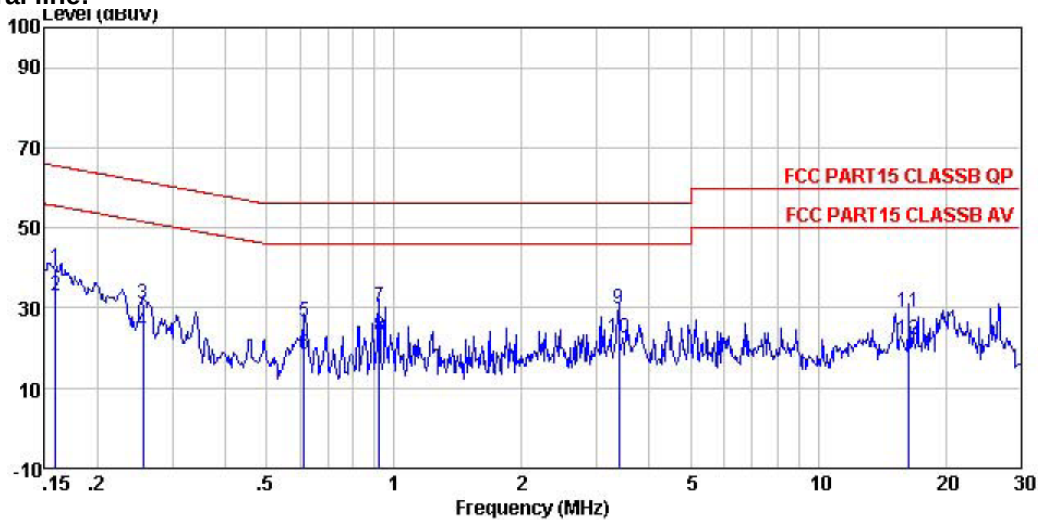
Live line:



Condition : FCC PART15 CLASSB QP LISN(2011) LINE
 Job No. : 950RF
 Test Mode : Transmitting mode
 Test Engineer: Gavin

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.155	39.50	0.68	0.10	40.28	65.74	-25.46	QP
2	0.155	32.46	0.68	0.10	33.24	55.74	-22.50	Average
3	0.614	25.93	0.53	0.10	26.56	56.00	-29.44	QP
4	0.614	19.18	0.53	0.10	19.81	46.00	-26.19	Average
5	0.923	29.53	0.49	0.10	30.12	56.00	-25.88	QP
6	0.923	22.57	0.49	0.10	23.16	46.00	-22.84	Average
7	3.381	28.62	0.34	0.10	29.06	56.00	-26.94	QP
8	3.381	21.69	0.34	0.10	22.13	46.00	-23.87	Average
9	6.488	29.71	0.27	0.13	30.11	60.00	-29.89	QP
10	6.488	22.38	0.27	0.13	22.78	50.00	-27.22	Average
11	15.718	32.39	0.17	0.20	32.76	60.00	-27.24	QP
12	15.718	25.64	0.17	0.20	26.01	50.00	-23.99	Average

Neutral line:



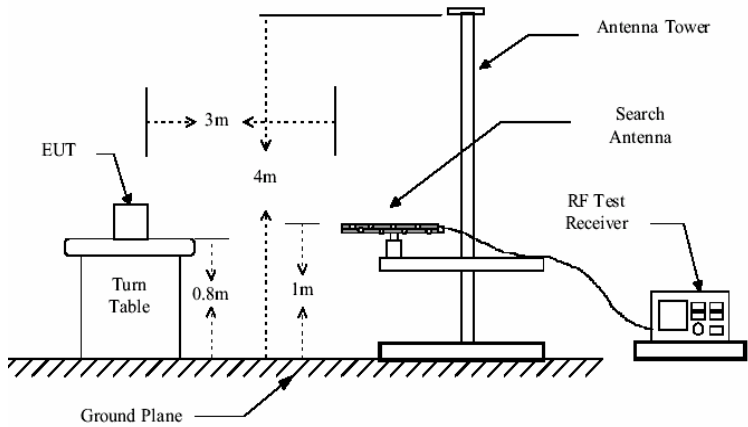
Condition : FCC PART15 CLASSB QP LISN(2011) NEUTRAL
 Job No. : 950RF
 Test Mode : Transmitting mode
 Test Engineer: Gavin

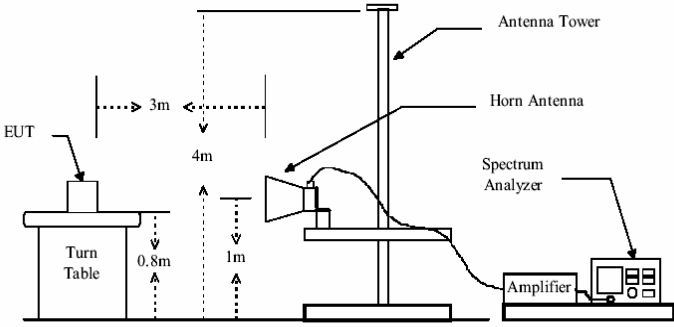
	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.159	39.28	0.68	0.10	40.06	65.52	-25.46	QP
2	0.159	32.18	0.68	0.10	32.96	55.52	-22.56	Average
3	0.256	30.22	0.63	0.10	30.95	61.56	-30.61	QP
4	0.256	23.51	0.63	0.10	24.24	51.56	-27.32	Average
5	0.614	25.81	0.53	0.10	26.44	56.00	-29.56	QP
6	0.614	17.68	0.53	0.10	18.31	46.00	-27.69	Average
7	0.923	29.69	0.49	0.10	30.28	56.00	-25.72	QP
8	0.923	22.34	0.49	0.10	22.93	46.00	-23.07	Average
9	3.381	29.16	0.34	0.10	29.60	56.00	-26.40	QP
10	3.381	22.13	0.34	0.10	22.57	46.00	-23.43	Average
11	16.398	28.79	0.17	0.20	29.16	60.00	-30.84	QP
12	16.398	21.68	0.17	0.20	22.05	50.00	-27.95	Average

Notes:

1. An initial pre-scan was performed on the live 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

6.3 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209				
Test Method:	ANSI C63.4:2003				
Test Frequency Range:	30MHz to 25GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		Peak	1MHz	10Hz	Average Value
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 (dBuV/m @3m)		Remark	
	30MHz-88MHz	40.00		Quasi-peak Value	
	88MHz-216MHz	43.50		Quasi-peak Value	
	216MHz-960MHz	46.00		Quasi-peak Value	
	960MHz-1GHz	54.00		Quasi-peak Value	
	Above 1GHz	54.00		Average Value	
		74.00		Peak Value	
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:	Below 1GHz				
	 Above 1GHz				

	 The diagram illustrates the test setup. An EUT (Equipment Under Test) is placed on a turn table at a height of 0.8m. The turn table is rotated 360 degrees. The EUT is positioned 3m away from the antenna tower. The antenna tower has a horn antenna at a height of 4m. The antenna height is varied from 1m to 4m. The spectrum analyzer is connected to the antenna tower via an amplifier.
Test Procedure:	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.
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement data:

6.3.1 Field Strength of The Fundamental Signal

Peak value:

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
2406.00	64.20	27.57	2.84	0	94.61	114.00	-19.39	Horizontal
2406.00	68.06	27.57	2.84	0	98.47	114.00	-15.53	Vertical
2440.00	64.72	27.48	2.86	0	95.06	114.00	-18.94	Horizontal
2440.00	69.14	27.48	2.86	0	99.48	114.00	-14.52	Vertical
2476.00	65.64	27.52	2.89	0	96.05	114.00	-17.95	Horizontal
2476.00	68.79	27.52	2.89	0	99.20	114.00	-14.80	Vertical

Average value:

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
2406.00	43.68	27.57	2.84	0	74.09	94.00	-19.91	Horizontal
2406.00	47.62	27.57	2.84	0	78.03	94.00	-15.97	Vertical
2440.00	44.60	27.48	2.86	0	74.94	94.00	-19.06	Horizontal
2440.00	48.71	27.48	2.86	0	79.05	94.00	-14.95	Vertical
2476.00	45.29	27.52	2.89	0	75.70	94.00	-18.30	Horizontal
2476.00	48.22	27.52	2.89	0	78.63	94.00	-15.37	Vertical

According to the follow transmitter output power (P_t) formula:

$$P_t = (E \times d)^2 / (30 \times g_t)$$

P_t =transmitter output power in watts

g_t =numeric gain of the transmitting antenna (unitless)

E =electric field strength in V/m

d = measurement distance in meters (m).

According to the above test data, $E_{max}=99.48\text{dBuV/m}=0.094\text{V/m}$, $d=3\text{m}$, $g_t=1.58$

$$P_t = (E \times d)^2 / 30 = (0.094 \times 3)^2 / (30 \times 1.58) = 0.00168\text{W}$$

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
53.13	39.78	16.11	0.33	31.99	24.23	40.00	-15.77	Vertical
94.76	39.24	13.48	0.47	31.71	21.48	43.50	-22.02	Vertical
162.61	43.73	8.74	0.63	32.05	21.05	43.50	-22.45	Vertical
566.62	44.31	17.85	1.61	31.39	32.38	46.00	-13.62	Vertical
689.57	51.16	18.86	1.89	31.66	40.25	46.00	-5.75	Vertical
739.66	47.43	19.29	1.97	31.61	37.08	46.00	-8.92	Vertical
492.47	48.33	16.39	1.45	31.66	34.51	46.00	-11.49	Horizontal
614.21	44.91	18.51	1.71	31.35	33.78	46.00	-12.22	Horizontal
663.47	51.05	18.69	1.84	31.55	40.03	46.00	-5.97	Horizontal
714.17	54.47	19.00	1.94	31.67	43.74	46.00	-2.26	Horizontal
763.38	52.87	19.63	2.00	31.57	42.93	46.00	-3.07	Horizontal
813.11	50.93	20.19	2.06	31.49	41.69	46.00	-4.31	Horizontal

■ Above 1GHz

Test channel:	Lowest channel
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Peak value:

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
4812.00	60.01	31.53	5.87	35.46	61.95	74.00	-12.05	Vertical
7218.00	45.74	36.47	7.10	35.31	54.00	74.00	-20.00	Vertical
9624.00	37.15	38.10	9.01	35.72	48.54	74.00	-25.46	Vertical
12030.00	*					74.00		Vertical
14436.00	*					74.00		Vertical
4812.00	48.12	31.53	5.87	35.46	50.06	74.00	-23.94	Horizontal
7218.00	41.83	36.47	7.10	35.31	50.09	74.00	-23.91	Horizontal
9624.00	38.06	38.10	9.01	35.72	49.45	74.00	-24.55	Horizontal
12030.00	*					74.00		Horizontal
14436.00	*					74.00		Horizontal

Average value:

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
4812.00	47.38	31.53	5.87	35.46	49.32	54.00	-4.68	Vertical
7218.00	37.41	36.47	7.10	35.31	45.67	54.00	-8.33	Vertical
9624.00	30.33	38.10	9.01	35.72	41.72	54.00	-12.28	Vertical
12030.00	*					54.00		Vertical
14436.00	*					54.00		Vertical
4812.00	41.46	31.53	5.87	35.46	43.40	54.00	-10.60	Horizontal
7218.00	34.11	36.47	7.10	35.31	42.37	54.00	-11.63	Horizontal
9624.00	30.12	38.10	9.01	35.72	41.51	54.00	-12.49	Horizontal
12030.00	*					54.00		Horizontal
14436.00	*					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
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Peak value:

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
4880.00	45.88	31.58	5.91	35.48	47.89	74.00	-26.11	Vertical
7320.00	40.17	36.47	7.14	35.27	48.51	74.00	-25.49	Vertical
9760.00	38.19	38.53	9.06	35.76	50.02	74.00	-23.98	Vertical
12200.00	*					74.00		Vertical
14640.00	*					74.00		Vertical
4880.00	45.01	31.58	5.91	35.48	47.02	74.00	-26.98	Horizontal
7320.00	39.16	36.47	7.14	35.27	47.50	74.00	-26.50	Horizontal
9760.00	37.14	38.53	9.06	35.76	48.97	74.00	-25.03	Horizontal
12200.00	*					74.00		Horizontal
14640.00	*					74.00		Horizontal

Average value:

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
4880.00	38.22	31.58	5.91	35.48	40.23	54.00	-13.77	Vertical
7320.00	33.15	36.47	7.14	35.27	41.49	54.00	-12.51	Vertical
9760.00	31.31	38.53	9.06	35.76	43.14	54.00	-10.86	Vertical
12200.00	*					54.00		Vertical
14640.00	*					54.00		Vertical
4880.00	37.39	31.58	5.91	35.48	39.40	54.00	-14.60	Horizontal
7320.00	32.16	36.47	7.14	35.27	40.50	54.00	-13.50	Horizontal
9760.00	30.27	38.53	9.06	35.76	42.10	54.00	-11.90	Horizontal
12200.00	*					54.00		Horizontal
14640.00	*					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:	Highest channel
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Peak value:

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
4952.00	55.41	31.69	5.95	35.49	57.56	74.00	-16.44	Vertical
7428.00	45.98	36.60	7.18	35.23	54.53	74.00	-19.47	Vertical
9904.00	37.22	38.66	9.11	35.78	49.21	74.00	-24.79	Vertical
12380.00	*					74.00		Vertical
14856.00	*					74.00		Vertical
4952.00	45.71	31.69	5.95	35.49	47.86	74.00	-26.14	Horizontal
7428.00	40.62	36.60	7.18	35.23	49.17	74.00	-24.83	Horizontal
9904.00	37.01	38.66	9.11	35.78	49.00	74.00	-25.00	Horizontal
12380.00	*					74.00		Horizontal
14856.00	*					74.00		Horizontal

Average value:

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
4952.00	47.71	31.69	5.95	35.49	49.86	54.00	-4.14	Vertical
7428.00	39.26	36.60	7.18	35.23	47.81	54.00	-6.19	Vertical
9904.00	30.38	38.66	9.11	35.78	42.37	54.00	-11.63	Vertical
12380.00	*					54.00		Vertical
14856.00	*					54.00		Vertical
4952.00	38.28	31.69	5.95	35.49	40.43	54.00	-13.57	Horizontal
7428.00	33.19	36.60	7.18	35.23	41.74	54.00	-12.26	Horizontal
9904.00	30.49	38.66	9.11	35.78	42.48	54.00	-11.52	Horizontal
12380.00	*					54.00		Horizontal
14856.00	*					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.

6.3.3 Bandedge emissions

Test channel:	Lowest channel
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Peak value:

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
2310.00	48.66	27.91	2.77	30.37	48.97	74.00	-25.03	Horizontal
2390.00	67.85	27.59	2.82	30.18	68.08	74.00	-5.92	Horizontal
2310.00	50.21	27.91	2.77	30.37	50.52	74.00	-23.48	Vertical
2390.00	71.22	27.59	2.82	30.18	71.45	74.00	-2.55	Vertical

Average value:

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
2310.00	38.46	27.91	2.77	30.37	38.77	54.00	-15.23	Horizontal
2390.00	39.46	27.59	2.82	30.18	39.69	54.00	-14.31	Horizontal
2310.00	40.16	27.91	2.77	30.37	40.47	54.00	-13.53	Vertical
2390.00	41.79	27.59	2.82	30.18	42.02	54.00	-11.98	Vertical

Test channel:	Highest channel
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Peak value:

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
2483.50	68.79	27.53	2.89	29.93	69.28	74.00	-4.72	Horizontal
2500.00	69.04	27.58	2.84	30.18	69.28	74.00	-4.72	Horizontal
2483.50	70.81	27.53	2.89	29.93	71.30	74.00	-2.70	Vertical
2500.00	70.23	27.58	2.84	30.18	70.47	74.00	-3.53	Vertical

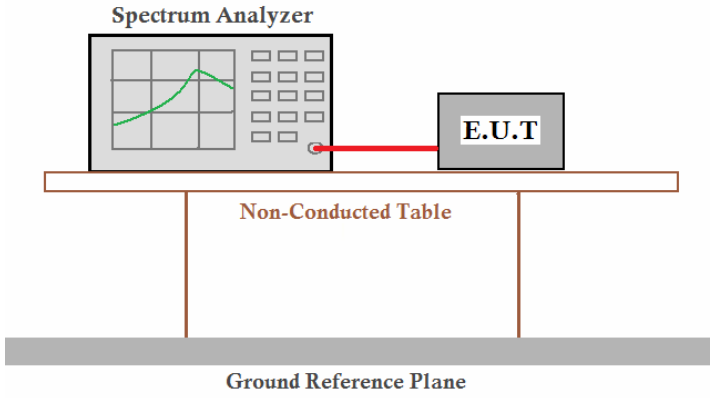
Average value:

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
2483.50	38.04	27.53	2.89	30.18	38.28	54.00	-15.72	Horizontal
2500.00	39.45	27.58	2.84	29.93	39.94	54.00	-14.06	Horizontal
2483.50	40.78	27.53	2.89	30.18	41.02	54.00	-12.98	Vertical
2500.00	42.75	27.58	2.84	29.93	43.24	54.00	-10.76	Vertical

Remark:

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

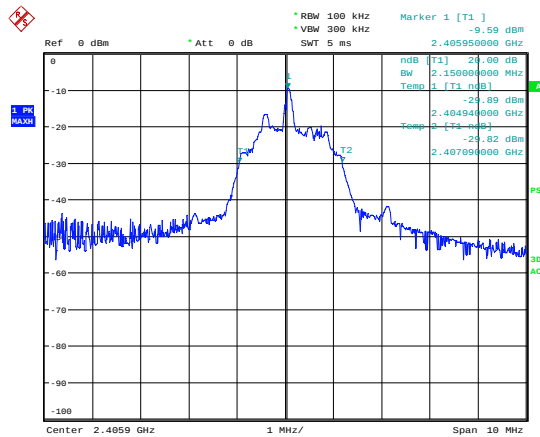
6.4 20dB Occupy Bandwidth

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:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.
Test Instruments:	Refer to section 5.8 for details
Test mode:	Transmitting mode
Test results:	Pass

Measurement Data

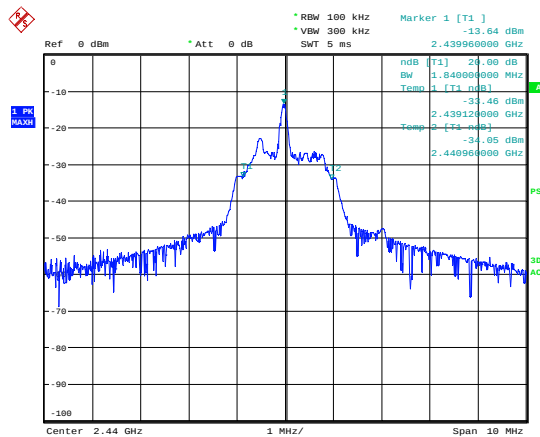
Test channel	20dB bandwidth(MHz)	Result
Lowest	2.15	Pass
Middle	1.84	Pass
Highest	1.77	Pass

Test plot as follows:



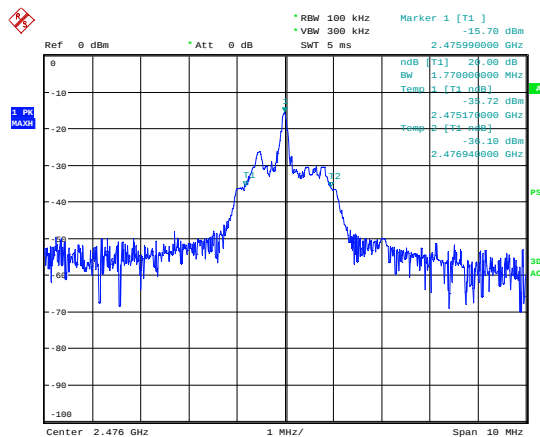
Date: 3.AUG.2012 12:29:45

Lowest channel



Date: 3.AUG.2012 12:30:18

Middle channel

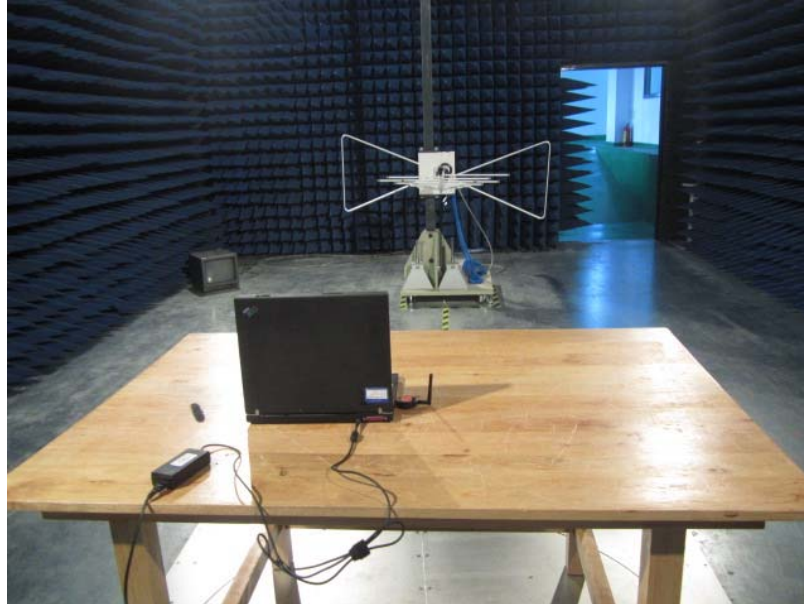


Date: 3.AUG.2012 12:30:58

Highest channel

7 Test Setup Photo

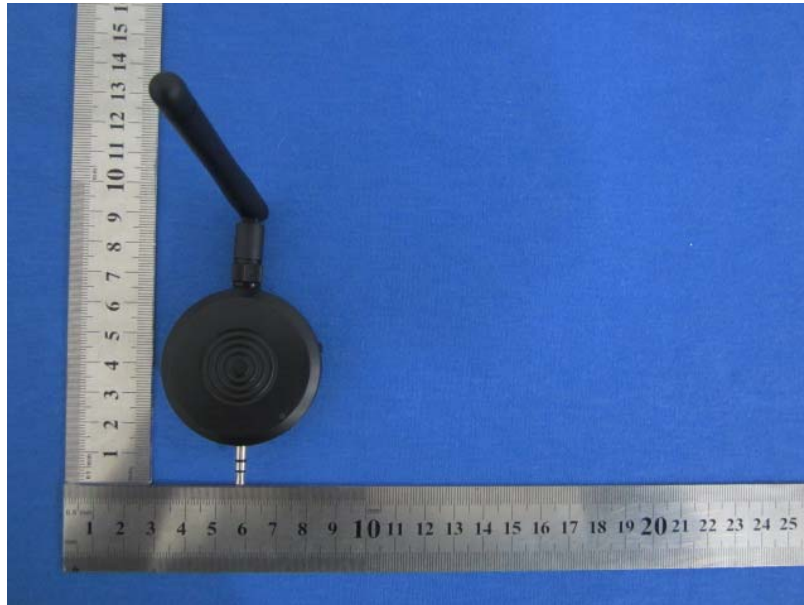
Radiated Spurious Emission



Conducted Emission



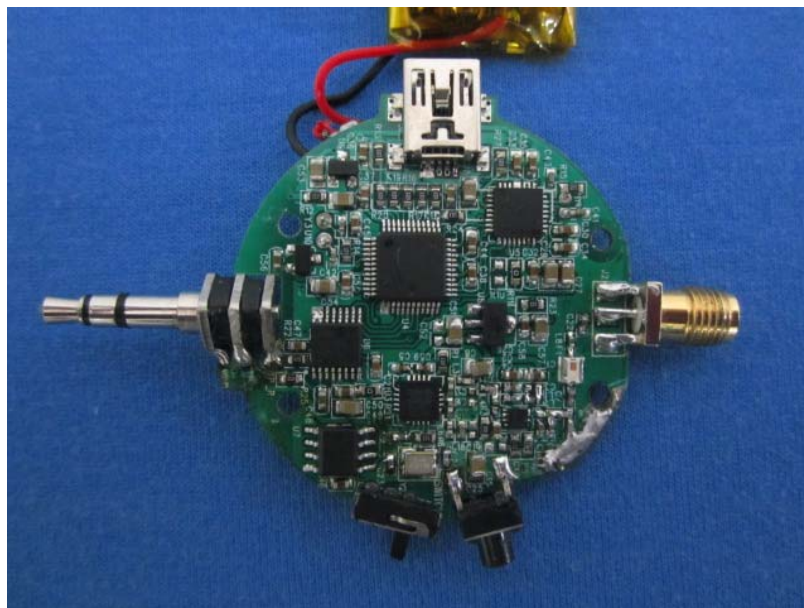
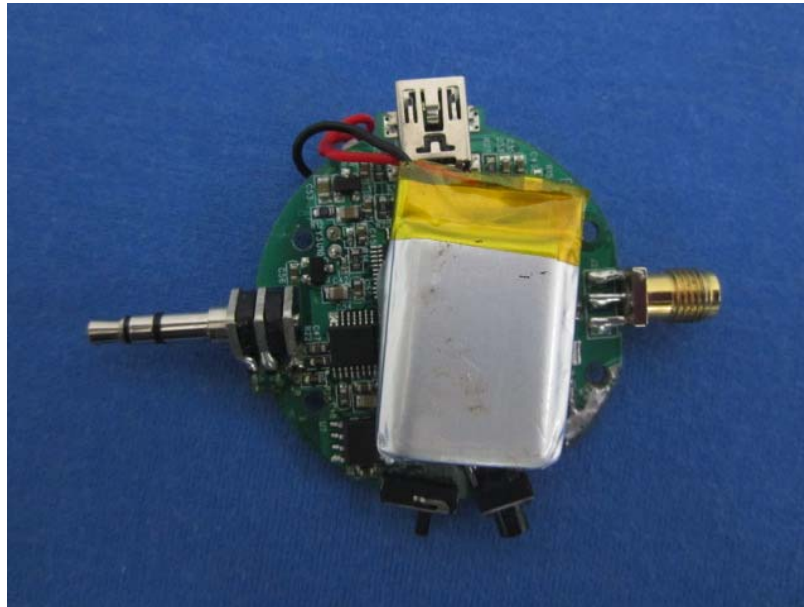
8 EUT Constructional Details













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