

FCC REPORT

Applicant: Front Electronics (H.K.) Ltd.

Address of Applicant: Rm 2919, Asia Trade Centre, 79 Lei Muk Road, Kwai Chung

Equipment Under Test (EUT)

Product Name: PS3/PS2/PC 3in1 updatable steering wheel

Model No.: FEL-2823

FCC ID: TAZ2823

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

Date of sample receipt: 28 July., 2011

Date of Test: 29 July. -05 Aug., 2011

Date of report issued: 17 Aug., 2011

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	2011-08-17	Original

Prepared By:

Collin He

Date:

2011-08-17

Project Engineer

Check By:

Hans.Hu

Date:

2011-08-17

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 (Radiated Emission)	15.249 (d)/15.205	Pass
20dB Occupied Bandwidth	15.215 (c)	Pass

Remark:

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

5 General Information

5.1 Client Information

Applicant:	Front Electronics (H.K.) Ltd.
Address of Applicant:	Rm 2919, Asia Trade Centre, 79 Lei Muk Road, Kwai Chung
Manufacturer:	Front Electronics (H.K.) Ltd.
Address of Manufacturer:	Rm 2919, Asia Trade Centre, 79 Lei Muk Road, Kwai Chung
Factory:	Shenzhen Front Electronics Co., Ltd.
Address of Factory:	lock 10, No. 2 Hexi Industrial Zone,Baoan, Shenzhen 518102 China

5.2 General Description of E.U.T.

Product Name:	PS3/PS2/PC 3in1 updatable steering wheel
Model No.:	FEL-2823
Operation Frequency:	2410MHz~2470MHz
Test Frequency:	Lower channel=2410MHz, Middle channel=2440MHz, Highest channel=2470MHz
Modulation type:	GFSK
Antenna Type:	Integral
Antenna gain:	2dBi
Power supply:	DC 6V=4*1.5V("AA" size battery)

5.3 Test mode

Charge mode	Keep the EUT in charge mode by PC.
Transmitting mode	Keep the EUT in transmitting continuously mode.

5.4 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 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.

5.5 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

5.6 Description of Support Units

Manufacturer	Description	Model	Serial Number
DELL	PC	OPTIPLEX745	GTS312
DELL	KEYBOARD	SK-8115	N/A
DELL	MOUSE	N/A	N/A
Cannon	Printer	IP1600	N/A
ELNEC	Encoder	Superpro/5000	N/A

5.7 Other Information Requested by the Customer

None.

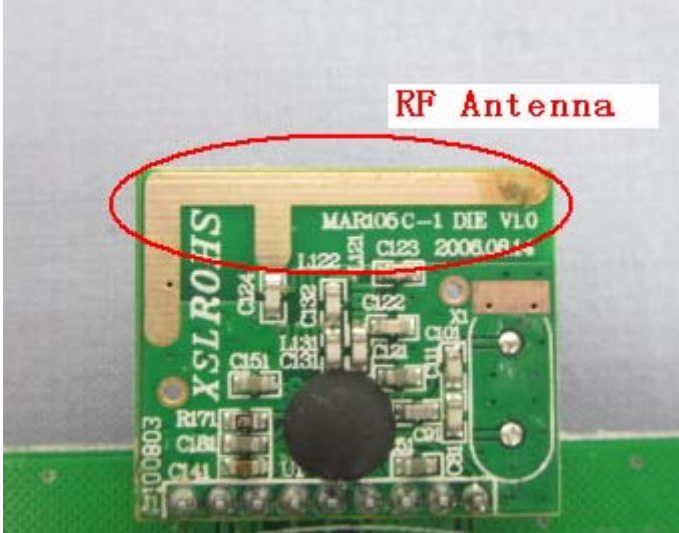
5.8 Test Instruments list

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	Jul. 04 2011	Jul. 03 2012
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. 04 2011	Jul. 03 2012
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	Jul. 04 2011	Jul. 03 2012
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	Jul. 04 2011	Jul. 03 2012
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	Jul. 04 2011	Jul. 03 2012
9	Coaxial Cable	GTS	N/A	GTS211	Jul. 04 2011	Jul. 03 2012
9	Coaxial cable	GTS	N/A	GTS210	Jul. 04 2011	Jul. 03 2012
11	Coaxial Cable	GTS	N/A	GTS212	Jul. 04 2011	Jul. 03 2012
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	Jul. 04 2011	Jul. 03 2012
13	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	Jul. 04 2011	Jul. 03 2012
14	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	Jul. 04 2011	Jul. 03 2012
15	Band filter	Amindeon	82346	GTS219	Jul. 04 2011	Jul. 03 2012

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)	GTS206	Jul. 04 2011	Jul. 03 2012
2	EMI Test Receiver	Rohde & Schwarz	ESCS30	GTS208	Jul. 04 2011	Jul. 03 2012
3	10dB Pulse Limita	Rohde & Schwarz	N/A	GTS209	Jul. 04 2011	Jul. 03 2012
4	LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	GTS207	Jul. 04 2011	Jul. 03 2012
5	Coaxial Cable	GTS	N/A	GTS406	Jul. 04 2011	Jul. 03 2012
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
15.203 requirement: <i>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.</i>	
E.U.T Antenna:	
<i>The antenna is no consideration of replacement. The best case gain of the antenna is 2dBi.</i>	
	

6.2 Conducted Emissions

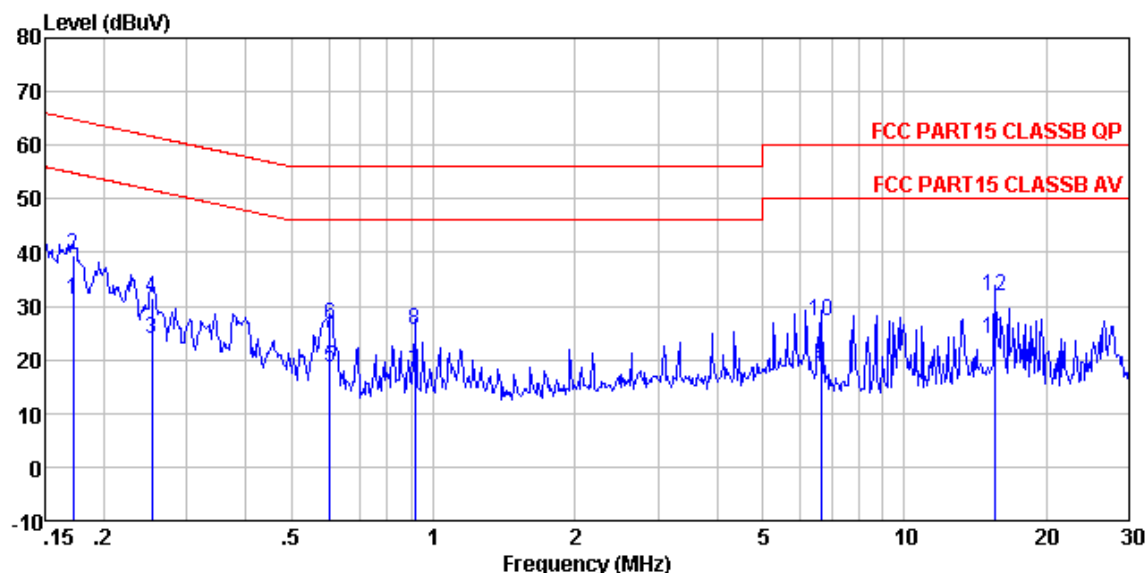
Test Requirement:	FCC Part15 C Section 15.207		
Test Method:	ANSI C63.4:2003		
Test Frequency Range:	150KHz to 30MHz		
Class / Severity:	Class B		
Receiver setup:	RBW=9KHz, VBW=30KHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
* Decreases with the logarithm of the frequency.			
Test procedure	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. 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). 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 setup:	Reference Plane LISN AUX Equipment E.U.T 40cm 80cm LISN Filter AC power EMI Receiver Test table/Insulation plane Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m		
Test Instruments:	Refer to section 5.8 for details		
Test mode:	Refer to section 5.3 for details		
Test results:	Pass		

Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

The worst mode: charge mode

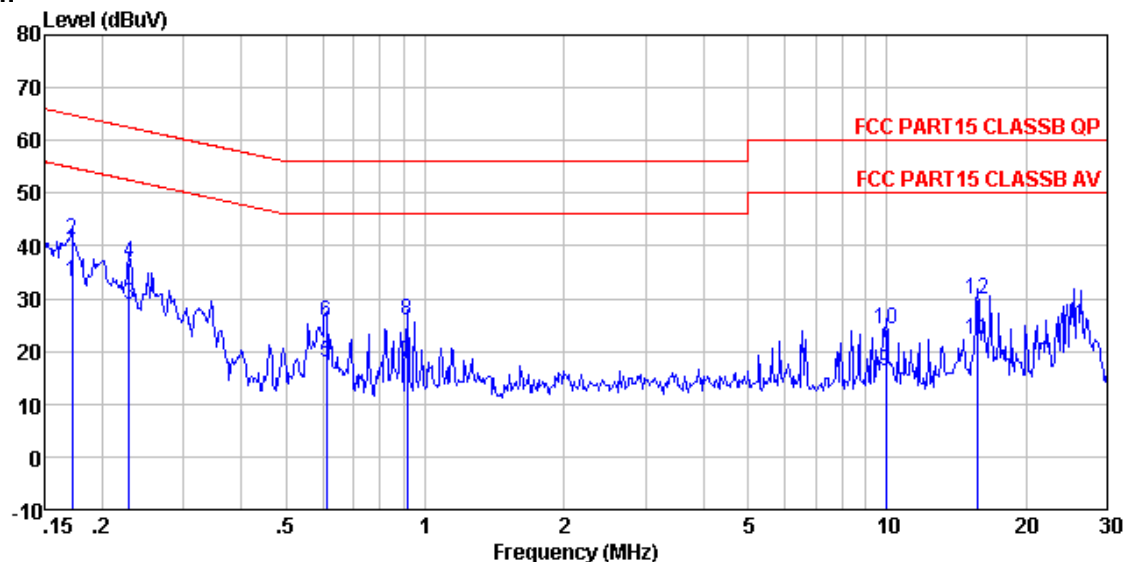
Line:



Condition : FCC PART15 CLASSB QP LISN(2011) LINE
 Job No. : 636RF
 Test Mode : Operation mode
 Test Engineer: Dick

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.172	30.46	0.67	0.10	31.23	54.86	-23.63	Average
2	0.172	38.79	0.67	0.10	39.56	64.86	-25.30	QP
3	0.253	23.04	0.63	0.10	23.77	51.64	-27.87	Average
4	0.253	30.87	0.63	0.10	31.60	61.64	-30.04	QP
5	0.604	17.85	0.53	0.10	18.48	46.00	-27.52	Average
6	0.604	25.81	0.53	0.10	26.44	56.00	-29.56	QP
7	0.914	16.87	0.49	0.10	17.46	46.00	-28.54	Average
8	0.914	24.79	0.49	0.10	25.38	56.00	-30.62	QP
9	6.662	18.89	0.27	0.13	19.29	50.00	-30.71	Average
10	6.662	26.94	0.27	0.13	27.34	60.00	-32.66	QP
11	15.635	23.45	0.17	0.20	23.82	50.00	-26.18	Average
12	15.635	31.37	0.17	0.20	31.74	60.00	-28.26	QP

Neutral:



Condition : FCC PART15 CLASSB QP LISN(2011) NEUTRAL
 Job No. : 636RF
 Test Mode : Operation mode
 Test Engineer: Dick

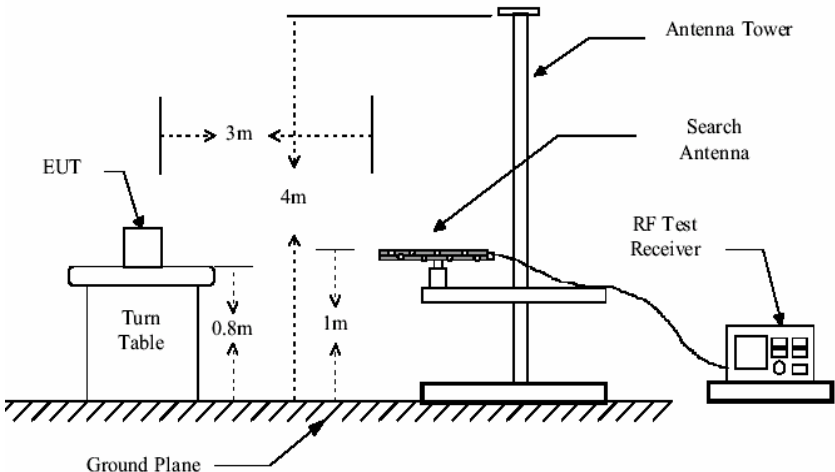
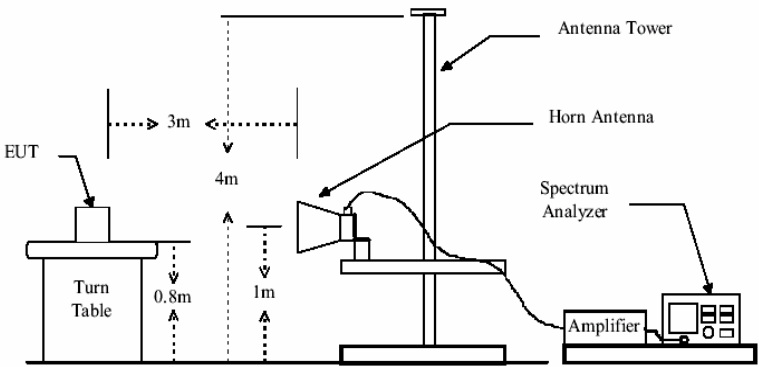
	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.172	32.45	0.67	0.10	33.22	54.86	-21.64	Average
2	0.172	40.39	0.67	0.10	41.16	64.86	-23.70	QP
3	0.229	28.13	0.64	0.10	28.87	52.48	-23.61	Average
4	0.229	36.08	0.64	0.10	36.82	62.48	-25.66	QP
5	0.611	17.13	0.53	0.10	17.76	46.00	-28.24	Average
6	0.611	25.02	0.53	0.10	25.65	56.00	-30.35	QP
7	0.914	17.34	0.49	0.10	17.93	46.00	-28.07	Average
8	0.914	25.29	0.49	0.10	25.88	56.00	-30.12	QP
9	9.966	15.74	0.22	0.20	16.16	50.00	-33.84	Average
10	9.966	23.66	0.22	0.20	24.08	60.00	-35.92	QP
11	15.718	21.87	0.17	0.20	22.24	50.00	-27.76	Average
12	15.718	29.36	0.17	0.20	29.73	60.00	-30.27	QP

Notes:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.

6.3 Radiated Emission

Test Requirement:	FCC Part15 C Section 15.249 and 15.209																								
Test Method:	ANSI C63.4:2003																								
Test Frequency Range:	30MHz to 25000MHz																								
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)																								
Receiver setup:	<table><tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr><tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>100KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr><tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr><tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr></table>					Frequency	Detector	RBW	VBW	Remark	30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak Value	Above 1GHz	Peak	1MHz	3MHz	Peak Value	Peak	1MHz	10Hz	Average Value	
Frequency	Detector	RBW	VBW	Remark																					
30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak Value																					
Above 1GHz	Peak	1MHz	3MHz	Peak Value																					
	Peak	1MHz	10Hz	Average Value																					
Limit: (Field strength of the fundamental signal)	<table><tr><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Remark</td></tr><tr><td rowspan="2">2400MHz-2483.5MHz</td><td>94.0</td><td>Average Value</td></tr><tr><td>114.0</td><td>Peak Value</td></tr></table>				Frequency	Limit (dBuV/m @3m)	Remark	2400MHz-2483.5MHz	94.0	Average Value	114.0	Peak Value													
Frequency	Limit (dBuV/m @3m)	Remark																							
2400MHz-2483.5MHz	94.0	Average Value																							
	114.0	Peak Value																							
Limit: (Spurious Emissions)	<table><tr><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Remark</td></tr><tr><td>30MHz-88MHz</td><td>40.0</td><td>Quasi-peak Value</td></tr><tr><td>88MHz-216MHz</td><td>43.5</td><td>Quasi-peak Value</td></tr><tr><td>216MHz-960MHz</td><td>46.0</td><td>Quasi-peak Value</td></tr><tr><td>960MHz-1GHz</td><td>54.0</td><td>Quasi-peak Value</td></tr><tr><td rowspan="2">Above 1GHz</td><td>54.0</td><td>Average Value</td></tr><tr><td>74.0</td><td>Peak Value</td></tr></table>				Frequency	Limit (dBuV/m @3m)	Remark	30MHz-88MHz	40.0	Quasi-peak Value	88MHz-216MHz	43.5	Quasi-peak Value	216MHz-960MHz	46.0	Quasi-peak Value	960MHz-1GHz	54.0	Quasi-peak Value	Above 1GHz	54.0	Average Value	74.0	Peak Value	
Frequency	Limit (dBuV/m @3m)	Remark																							
30MHz-88MHz	40.0	Quasi-peak Value																							
88MHz-216MHz	43.5	Quasi-peak Value																							
216MHz-960MHz	46.0	Quasi-peak Value																							
960MHz-1GHz	54.0	Quasi-peak Value																							
Above 1GHz	54.0	Average Value																							
	74.0	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 Procedure:	a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. 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. d. 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 rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. 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 setup:	Below 1GHz  Above 1GHz 
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Note:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

$$\text{Final Test Level} = \text{Receiver Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Preamplifier Factor}$$

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
2410	72.2	27.57	3.37	30.06	73.08	114.00	-40.92	Horizontal
2410	74.2	27.57	3.37	30.06	75.08	114.00	-38.92	Vertical
2440	77.37	27.48	3.43	29.99	78.29	114.00	-35.71	Horizontal
2440	79.17	27.48	3.43	29.99	80.09	114.00	-33.91	Vertical
2470	78.16	27.49	3.46	29.96	79.15	114.00	-34.85	Horizontal
2470	80.16	27.49	3.46	29.96	81.15	114.00	-32.85	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
2410	64.1	27.57	3.37	30.06	64.98	94.00	-29.02	Horizontal
2410	66.1	27.57	3.37	30.06	66.98	94.00	-27.02	Vertical
2440	69.57	27.48	3.43	29.99	70.49	94.00	-23.51	Horizontal
2440	71.37	27.48	3.43	29.99	72.29	94.00	-21.71	Vertical
2470	70.06	27.49	3.46	29.96	71.05	94.00	-22.95	Horizontal
2470	72.06	27.49	3.46	29.96	73.05	94.00	-20.95	Vertical

6.3.2 Spurious Emissions

30MHz~1GHz

Test mode: Transmitting

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
59.86	49.87	14.84	0.70	31.95	33.46	40.00	-6.54	Vertical
72.08	53.74	13.17	0.86	31.87	35.90	40.00	-4.10	Vertical
84.11	49.08	12.59	1.00	31.79	30.88	40.00	-9.12	Vertical
107.89	51.53	12.35	1.22	31.74	33.36	43.50	-10.14	Vertical
131.76	54.02	10.34	1.40	31.88	33.88	43.50	-9.62	Vertical
59.86	55.56	11.92	0.70	31.95	36.23	40.00	-3.77	Horizontal
72.08	51.59	9.13	0.86	31.87	29.71	40.00	-10.29	Horizontal
107.89	51.15	11.48	1.22	31.74	32.11	43.50	-11.39	Horizontal
216.02	56.31	11.05	1.84	32.27	36.93	46.00	-9.07	Horizontal
239.99	59.41	11.81	1.92	32.28	40.86	46.00	-5.14	Horizontal

Above 1GHz					
Test mode:	Transmitting	Test channel:	Lowest	Remark:	Peak

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
1585	40.24	25.00	2.52	25.79	41.97	74.00	-32.03	Vertical
4820	38.24	31.78	5.32	24.09	51.25	74.00	-22.75	Vertical
7230	33.70	36.19	6.88	26.44	50.33	74.00	-23.67	Vertical
9640	30.37	38.07	8.96	25.36	52.04	74.00	-21.96	Vertical
12050	*					74.00		Vertical
14460	*					74.00		Vertical
1585	38.54	25.00	2.52	25.79	40.27	74.00	-33.73	Horizontal
4820	36.14	31.78	5.32	24.09	49.15	74.00	-24.85	Horizontal
7230	31.50	36.19	6.88	26.44	48.13	74.00	-25.87	Horizontal
9640	28.07	38.07	8.96	25.36	49.74	74.00	-24.26	Horizontal
12050	*					74.00		Horizontal
14460	*					74.00		Horizontal

Test mode:	Transmitting	Test channel:	Lowest	Remark:	average
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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
1585	32.44	25.00	2.52	25.79	34.17	54.00	-19.83	Vertical
4820	30.04	31.78	5.32	24.09	43.05	54.00	-10.95	Vertical
7230	25.40	36.19	6.88	26.44	42.03	54.00	-11.97	Vertical
9640	21.97	38.07	8.96	25.36	43.64	54.00	-10.36	Vertical
12050	*					54.00		Vertical
14460	*					54.00		Vertical
1585	30.74	25.00	2.52	25.79	32.47	54.00	-21.53	Horizontal
4820	27.94	31.78	5.32	24.09	40.95	54.00	-13.05	Horizontal
7230	23.20	36.19	6.88	26.44	39.83	54.00	-14.17	Horizontal
9640	19.67	38.07	8.96	25.36	41.34	54.00	-12.66	Horizontal
12050	*					54.00		Horizontal
14460	*					54.00		Horizontal

Remark:

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

Test mode:	Transmitting	Test channel:	Middle	Remark:	Peak
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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
1594	42.14	24.99	2.52	26.15	43.50	74.00	-30.50	Vertical
4880	39.07	31.86	5.42	23.99	52.36	74.00	-21.64	Vertical
7320	33.47	36.37	6.91	26.62	50.13	74.00	-23.87	Vertical
9760	30.72	38.35	9.01	25.30	52.78	74.00	-21.22	Vertical
12200	*					74.00		Vertical
14640	*					74.00		Vertical
1594	40.44	24.99	2.52	26.15	41.80	74.00	-32.20	Horizontal
4880	37.17	31.86	5.42	23.99	50.46	74.00	-23.54	Horizontal
7320	31.47	36.37	6.91	26.62	48.13	74.00	-25.87	Horizontal
9760	28.62	38.35	9.01	25.30	50.68	74.00	-23.32	Horizontal
12200	*					74.00		Horizontal
14640	*					74.00		Horizontal

Test mode:	Transmitting	Test channel:	Middle	Remark:	average
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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
1594	34.44	24.99	2.52	26.15	35.80	54.00	-18.20	Vertical
4880	31.17	31.86	5.42	23.99	44.46	54.00	-9.54	Vertical
7320	25.47	36.37	6.91	26.62	42.13	54.00	-11.87	Vertical
9760	22.62	38.35	9.01	25.30	44.68	54.00	-9.32	Vertical
12200	*					54.00		Vertical
14640	*					54.00		Vertical
1594	32.74	24.99	2.52	26.15	34.10	54.00	-19.90	Horizontal
4880	29.27	31.86	5.42	23.99	42.56	54.00	-11.44	Horizontal
7320	23.47	36.37	6.91	26.62	40.13	54.00	-13.87	Horizontal
9760	20.52	38.35	9.01	25.30	42.58	54.00	-11.42	Horizontal
12200	*					54.00		Horizontal
14640	*					54.00		Horizontal

Remark:

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

Test mode:	Transmitting	Test channel:	Highest	Remark:	Peak
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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
1594	42.81	24.99	2.52	26.15	44.17	74.00	-29.83	Vertical
4940	40.48	31.91	5.46	23.94	53.91	74.00	-20.09	Vertical
7410	34.75	36.52	6.93	26.84	51.36	74.00	-22.64	Vertical
9880	31.55	38.72	9.06	25.24	54.09	74.00	-19.91	Vertical
12350	*					74.00		Vertical
14820	*					74.00		Vertical
1594	41.11	24.99	2.52	26.15	42.47	74.00	-31.53	Horizontal
4940	38.38	31.91	5.46	23.94	51.81	74.00	-22.19	Horizontal
7410	32.55	36.52	6.93	26.84	49.16	74.00	-24.84	Horizontal
9880	29.25	38.72	9.06	25.24	51.79	74.00	-22.21	Horizontal
12350	*					74.00		Horizontal
14820	*					74.00		Horizontal

Test mode:	Transmitting	Test channel:	Highest	Remark:	average
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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
1594	35.01	24.99	2.52	26.15	36.37	54.00	-17.63	Vertical
4940	32.28	31.91	5.46	23.94	45.71	54.00	-8.29	Vertical
7410	26.45	36.52	6.93	26.84	43.06	54.00	-10.94	Vertical
9880	23.15	38.72	9.06	25.24	45.69	54.00	-8.31	Vertical
12350	*					54.00		Vertical
14820	*					54.00		Vertical
1594	33.31	24.99	2.52	26.15	34.67	54.00	-19.33	Horizontal
4940	30.18	31.91	5.46	23.94	43.61	54.00	-10.39	Horizontal
7410	24.25	36.52	6.93	26.84	40.86	54.00	-13.14	Horizontal
9880	20.85	38.72	9.06	25.24	43.39	54.00	-10.61	Horizontal
12350	*					54.00		Horizontal
14820	*					54.00		Horizontal

Remark:

1. "*" means this data is too weak; instrument signal is unable to test.
2. Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Pre-amplifier Factor
3. The emission levels of other frequencies are very lower than the limit and not shown in test report.

6.3.3 Band edge (Radiated Emission)

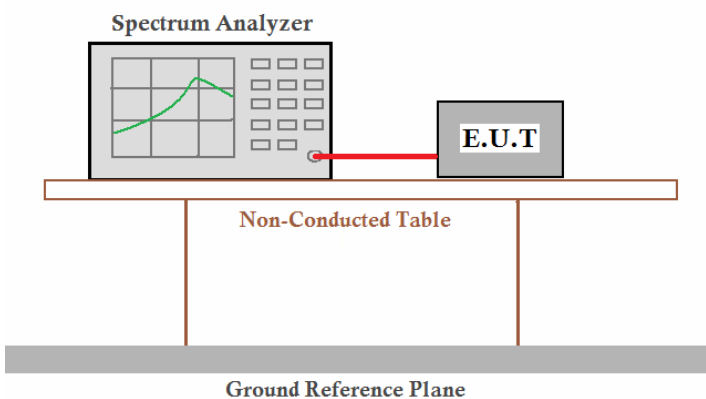
Test mode:		Transmitting		Test channel:		Lowest		Remark:		Peak	
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization			
2390	47.48	27.67	3.29	30.18	48.26	74.00	-25.74	Horizontal			
2400	49.07	27.61	3.33	30.10	49.91	74.00	-24.09	Horizontal			
2390	49.83	27.67	3.29	30.18	50.61	74.00	-23.39	Vertical			
2400	51.31	27.61	3.33	30.10	52.15	74.00	-21.85	Vertical			

Test mode:		Transmitting		Test channel:		Lowest		Remark:		Average	
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	35.62	27.67	3.29	30.18	36.40	54.00	-17.60	Horizontal			
2400	38.76	27.61	3.33	30.10	39.60	54.00	-14.40	Horizontal			
2390	38.79	27.67	3.29	30.18	39.57	54.00	-14.43	Vertical			
2400	41.07	27.61	3.33	30.10	41.91	54.00	-12.09	Vertical			

Test mode:		Transmitting		Test channel:		Highest		Remark:		Peak	
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	47.48	27.67	3.29	30.18	48.26	74.00	-25.74	Horizontal			
2400	49.07	27.61	3.33	30.10	49.91	74.00	-24.09	Horizontal			
2390	49.83	27.67	3.29	30.18	50.61	74.00	-23.39	Vertical			
2400	51.31	27.61	3.33	30.10	52.15	74.00	-21.85	Vertical			

Test mode:		Transmitting		Test channel:		Highest		Remark:		Average	
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	35.62	27.67	3.29	30.18	36.40	54.00	-17.60	Horizontal			
2400	38.76	27.61	3.33	30.10	39.60	54.00	-14.40	Horizontal			
2390	38.79	27.67	3.29	30.18	39.57	54.00	-14.43	Vertical			
2400	41.07	27.61	3.33	30.10	41.91	54.00	-12.09	Vertical			

6.4 20dB Bandwidth

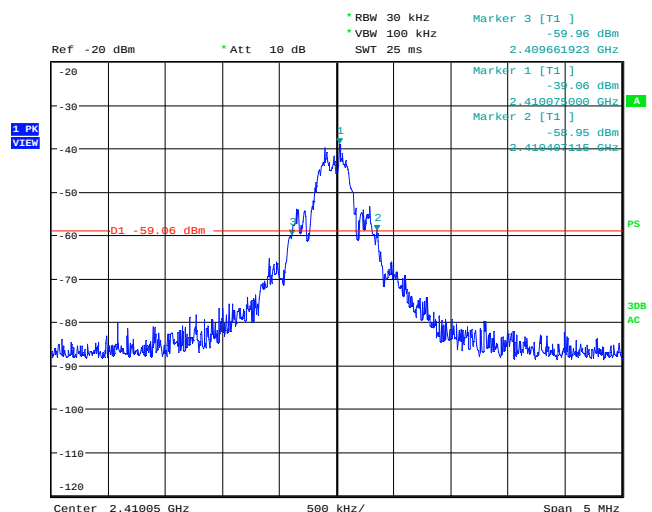
Test Requirement:	FCC Part15 C Section 15.249/15.215
Test Method:	ANSI C63.4:2003
Receiver setup:	RBW=30KHz, VBW=100KHz, detector: Peak
Limit:	Operation Frequency range 2400MHz-2483.5MHz
Test Procedure:	1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT. 2. Set the EUT to proper test channel. 3. Max hold the radiated emissions, mark the peak power frequency point and the -20dB upper and lower frequency points. 4. Read 20dB bandwidth.
Test setup:	 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.
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement Data

Test channel	20dB bandwidth (MHz)	Results
Lowest	0.745	Pass
Middle	0.777	Pass
Highest	0.745	Pass

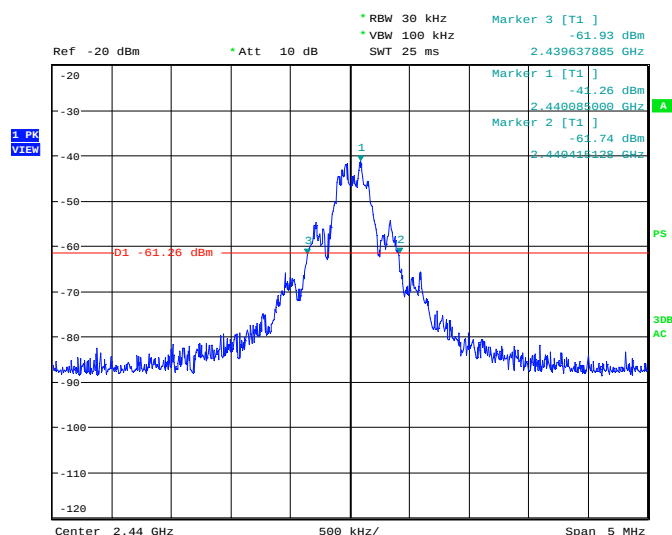
Test plot as follows:

Test channel:	Lowest	
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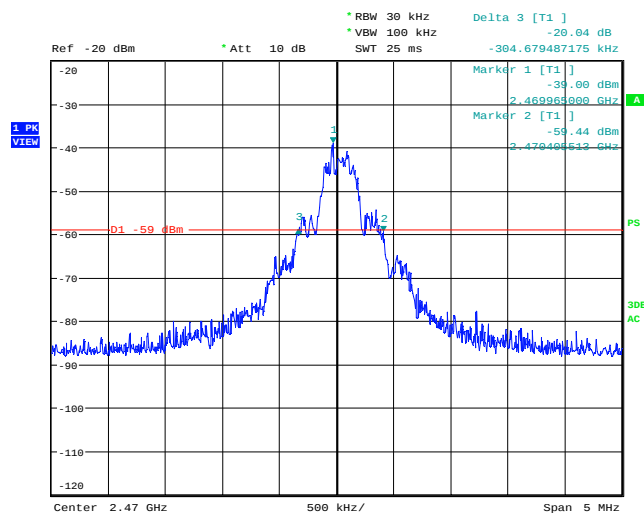
Date: 31.JUL.2011 16:01:58

Test channel:	Middle	
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Date: 31.JUL.2011 15:54:27

Test channel:	Highest	
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Date: 31.JUL.2011 15:57:08