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FEDERAL COMMUNICATIONS COMMISSION
Registration number: 282399

Report No.: GLEMO090300585RFT-2
Page: 1 of 19
FCC ID: BOU-HSB3280SW

TEST REPORT

Application No. : GLEMO090300585RF

Applicant: Philips Consumer Lifestyle.

FCC ID: BOU-HSB3280SW

Frequency Band: 2402-2480MHz

Equipment Under Test (EUT):

Name: Soundbar Speaker

Model No.: HSB3280/XX, HSB3280/37, HSB3280/F7*

* Please refer to section 2 of this report which indicates which item was actually tested and which were **electrically** identical.

Trade mark: PHILIPS

Serial No.: Not supplied by client

Standards: FCC PART 15 SUBPART C: 2007

Please refer to section 2 for further details.

Date of Receipt: 30 June 2008

Date of Test: 30 June to 10 July 2008

Date of Re-receipt: 10 March 2009

Date of Issue: 10 March 2009

Test Result :	PASS *
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In the configuration tested, the EUT complied with the standards specified above.

Stephen Guo

Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. 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.

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2 Test Summary

Test	Test Requirement	Standard Paragraph	Result
Field Strength of Fundamental	FCC PART 15 :2007	Section 15.249 (a)	PASS
Field Strength of Unwanted Emissions	FCC PART 15 :2007	Section 15.249 (a) Section 15.249 (d)	PASS
Occupied Bandwidth	FCC PART 15 :2007	Section 15.249	PASS
Band Edges	FCC PART 15 :2007	Section 15.249 (d)	PASS

Remark:

Tx: In this whole report Tx (or tx) means Transmitter.

Rx: In this whole report Rx (or rx) means Receiver.

♣ Model No.: HSB3280/XX, HSB3280/37, HSB3280/F7

(XX-may employ suffix numbers and/or letters to denote minor cosmetic changes, F7,37 etc.)

Only the Model HSB3280/37 tested, since the electrical circuit design, layout, components used outer structures and internal wiring for models are the same, except the model number.

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4 General Information

4.1 Client Information

Applicant Name: Philips Consumer Lifestyle.
Applicant Address: 3029 East Governor John Sevier Hwy. Knoxville, Tennessee,
United States 37914

4.2 General Description of E.U.T.

Product Name: Soundbar Speaker
Model: HSB3280/XX, HSB3280/37, HSB3280/F7
Power Supply: 120Vac 60Hz for Subwoofer
Adaptor: N/A
Power Cord: 1.2m X 2 wires unscreened AC cable

4.3 Description of EUT operation

Type of Modulation FHSS
Frequency Band 2402MHz ~ 2480MHz
Antenna Type Integrate Antenna

4.4 Standards Applicable for Testing

The standard used was FCC PART 15, SUBPART C (2007) section 15.249.

4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory,
198 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District,
Guangzhou, China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.

4.6 Other Information Requested by the Customer

None.

4.7 Test Facility

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

- **NVLAP – Lab Code: 200611-0**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

- **FCC – Registration No.: 282399**

SGS-CSTC Standards Technical Services Co., Ltd., 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 282399, May 31, 2002.



5 Equipments Used during Test

RE in Chamber						
No:	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
EMC0525	Compact Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	N/A	N/A	N/A
EMC0522	EMI Test Receiver	Rohde & Schwarz	ESIB26	100249	28-01-2008	28-01-2009
N/A	EMI Test Software	Audix	E3	N/A	N/A	N/A
EMC0514	Coaxial cable	SGS	N/A	N/A	04-12-2007	04-12-2008
EMC0524	Bi-log Type Antenna	Schaffner -Chase	CBL6112B	2966	12-08-2007	12-08-2008
EMC0519	Bilog Type Antenna	Schaffner -Chase	CBL6143	5070	12-08-2007	12-08-2008
EMC0517	Horn Antenna	Rohde & Schwarz	HF906	100095	12-08-2007	12-08-2008
EMC0040	Spectrum Analyzer	Rohde & Schwarz	FSP30	100324	05-12-2007	05-12-2008
EMC0520	0.1-1300 MHz Pre-Amplifier	HP	8447D OPT 010	2944A0625 2	11-03-2008	11-03-2009
EMC0521	1-26.5 GHz Pre-Amplifier	Agilent	8449B	3008A0164 9	11-03-2008	11-03-2009
EMC0075	310N Amplifier	Sonama	310N	272683	10-09-2007	10-09-2008
EMC0523	Active Loop Antenna	EMCO	6502	00042963	09-08-2006	09-08-2008
EMC0530	10m Semi- Anechoic Chamber	ETS	N/A	N/A	10-08-2007	10-08-2008

Conducted Emission						
No:	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
EMC0306	Shielding Room	Zhong Yu	8 x 3 x 3.8 m ³	N/A	N/A	N/A
EMC0102	LISN	Schaffner Chase	MNZ050D/1	1421	14-12-2007	14-12-2008
EMC0118	Two-line v-netwok	Rohde & Schwarz	ENV216	3560.6550. 02	16-08--2007	16-08--2008
EMC0506	EMI Test Receiver	Rohde & Schwarz	ESCS30	100085	14-12-2007	14-12-2008
EMC0107	Coaxial Cable	SGS	2m	N/A	24-11-2007	26-11-2008
EMC0106	Voltage Probe	SGS	N/A	N/A	N/A	N/A
EMC0120	8 Line LISN	Fischer Custom Communications Inc.	FCC-TLISN-T8-02	20550	21-02-2008	21-02-2009
EMC0121	4 Line LISN	Fischer Custom Communications Inc.	FCC-TLISN-T4-02	20549	21-02-2008	21-02-2009
EMC0122	2 Line LISN	Fischer Custom Communications Inc.	FCC-TLISN-T2-02	20548	21-02-2008	21-02-2009

General used equipment						
No:	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
EMC0006	DMM	Fluke	73	70681569	27-09-2007	27-09-2008
EMC0007	DMM	Fluke	73	70671122	27-09-2007	27-09-2008

6 Test Result

6.1 E.U.T. Operation

Input voltage:	120Vac 60Hz
Operating Environment:	
Temperature:	26°C
Humidity:	56% RH
Atmospheric Pressure:	1005mbar
EUT Operation:	<p>The program used to control the EUT for staying in continuous transmitting and receiving mode is programmed by manufacturer .</p> <p>Channel lowest (2402MHz), middle (2440MHz) and highest (2480MHz) are chosen for full testing.</p> <p>Test the Subwoofer in transmitting mode.</p>

6.2 Test Procedure & Measurement Data

6.2.1 Field Strength of Fundamental & Field Strength of Unwanted Emissions

Test Requirement:	FCC Part15 C Section 15.249(a) & (d)		
Test Method:	Based on FCC Part15 C Section 15.249 & ANSI C63.4		
Test Date:	09 July 2008		
Measurement Distance:	3m (Semi-Anechoic Chamber)		
Frequency range	30 MHz – 25GHz for transmitting mode. Test instrumentation resolution bandwidth 120 kHz (30 MHz - 1000 MHz), 1 MHz (1000 MHz – 25GHz)		
Operation:	Receive antenna scan height 1 - 4 m, polarization Vertical/ Horizontal, a turntable rotate through 360° in the horizontal plane and it is used to support the test sample at 0.8m above the ground plane.		
Requirements:			
FCC Part 15.249(a)			
Fundamental Frequency (MHz)	Field Strength of Fundamental (dB _u V/m @ 3m)	Field Strength of Harmonics (dB _u V/m @ 3m)	
902 to 928	94.0	54.0	
2400 to 2483.5	94.0	54.0	
5725 to 5875	94.0	54.0	
24000 to 24250	108.0	68.0	

FCC Part 15.249(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.

Remark:

The fundamental frequency range of the EUT is 2402MHz ~ 2480MHz.

The limit for average field strength dB_uV/m for the fundamental frequency = 94.0 dB_uV/m.

The limit for Peak field strength dB_uV/m for the fundamental frequency = 114.0 dB_uV/m.

No fundamental is allowed in the restricted bands.

The limit for average field strength dB_uV/m for the harmonics = 54.0 dB_uV/m.

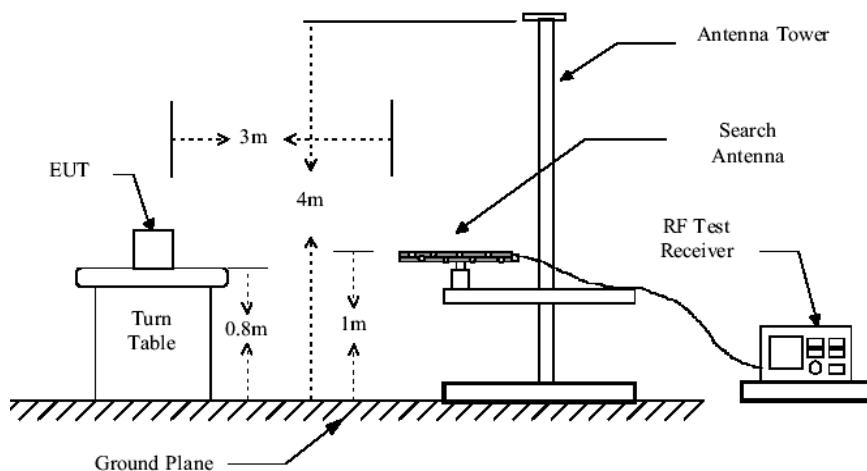
The limit for peak field strength dB_uV/m for the harmonics = 74.0 dB_uV/m.

Emission radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or 54.0 dB_uV/m in 15.209. Here the limit for the other emission is 54.0 dB_uV/m.

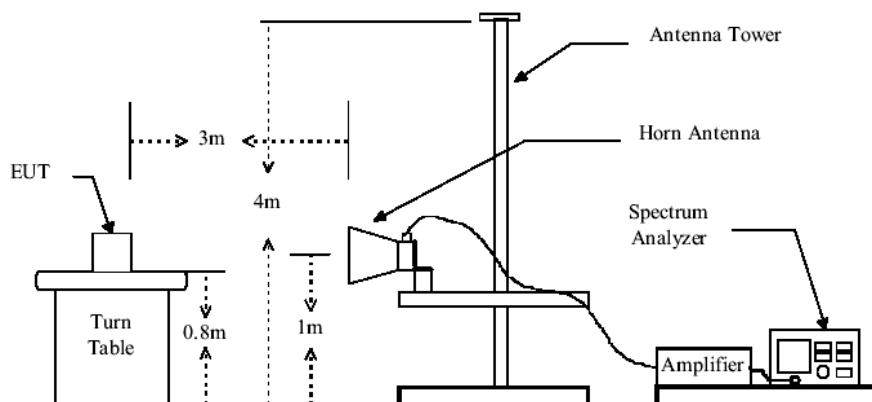
Test Procedure: The procedure used was ANSI Standard C63.4-2003. The receiver was scanned from 30MHz to 25GHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery. Pretest the equipment on 3 axis, and the worst case emissions were reported.

Test Configuration:

30MHz to 1GHz:



Above 1GHz:



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

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Peramplifier Factor

The following test results were performed on the Host:

1. Test in Channel lowest (2402MHz), keep in continuously transmitting status.

(a) Antenna polarization: Horizontal

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)	Remark
2401.912	94.08	28.55	4.60	34.77	92.46	114.00	-21.54	Peak
2401.912	93.09	28.55	4.60	34.77	91.47	94.00	-2.53	Average
4804.082	53.29	33.19	6.90	33.01	60.37	74.00	-13.63	Peak
4804.082	45.78	33.19	6.90	33.01	52.86	54.00	-1.14	Average

(b) Antenna polarization: Vertical

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)	Remark
2401.893	89.93	28.55	4.60	34.77	88.31	114.00	-25.69	Peak
2401.893	88.88	28.55	4.60	34.77	87.26	94.00	-6.74	Average
4803.481	46.29	33.19	6.90	33.01	53.37	74.00	-20.63	Peak
4803.481	34.32	33.19	6.90	33.01	41.40	54.00	-12.60	Average

2. Test in Channel middle (2440MHz), keep in continuously transmitting status.

(a) Antenna polarization: Horizontal

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)	Remark
2440.000	93.86	28.69	4.60	34.74	92.41	114.00	-21.59	Peak
2440.000	91.82	28.69	4.60	34.74	90.37	94.00	-3.63	Average
4880.000	53.53	33.27	7.20	32.97	61.03	74.00	-12.97	Peak
4880.000	45.06	33.27	7.20	32.97	52.56	54.00	-1.44	Average

(b) Antenna polarization: Vertical

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)	Remark
2440.000	85.62	28.69	4.60	34.74	84.17	114.00	-29.83	Average
2440.000	88.34	28.69	4.60	34.74	86.89	94.00	-7.11	Peak
4880.000	34.25	33.27	7.20	32.97	41.75	74.00	-32.25	Average
4880.000	44.16	33.27	7.20	32.97	51.66	54.00	-2.34	Peak

3. Test in Channel highest (2480MHz), keep in continuously transmitting status.

(a) Antenna polarization: Horizontal

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)	Remark
2479.396	92.20	28.78	4.67	34.72	90.93	114.00	-23.07	Average
2479.396	93.26	28.78	4.67	34.72	91.99	94.00	-2.01	Peak
4959.729	53.23	33.36	7.33	32.92	61.00	74.00	-13.00	Peak
4959.729	45.19	33.36	7.33	32.92	52.96	54.00	-1.04	Average

(b) Antenna polarization: Vertical

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)	Remark
2479.960	89.59	28.78	4.67	34.72	88.32	114.00	-25.68	Peak
2479.960	88.23	28.78	4.67	34.72	86.96	94.00	-7.04	Average
4959.514	46.22	33.36	7.33	32.92	53.99	74.00	-20.01	Peak
4959.514	36.19	33.36	7.33	32.92	43.96	54.00	-10.04	Average

Remark:

- 1). According to 15.249 (e) As shown in Section 15.35(b), for frequencies above 1000 MHz, the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.
- 2) Sweep from 30MHz to 25GHz, find the max radiated emissions and record it, when the emissions are too weak to be detected, it will not be reported.

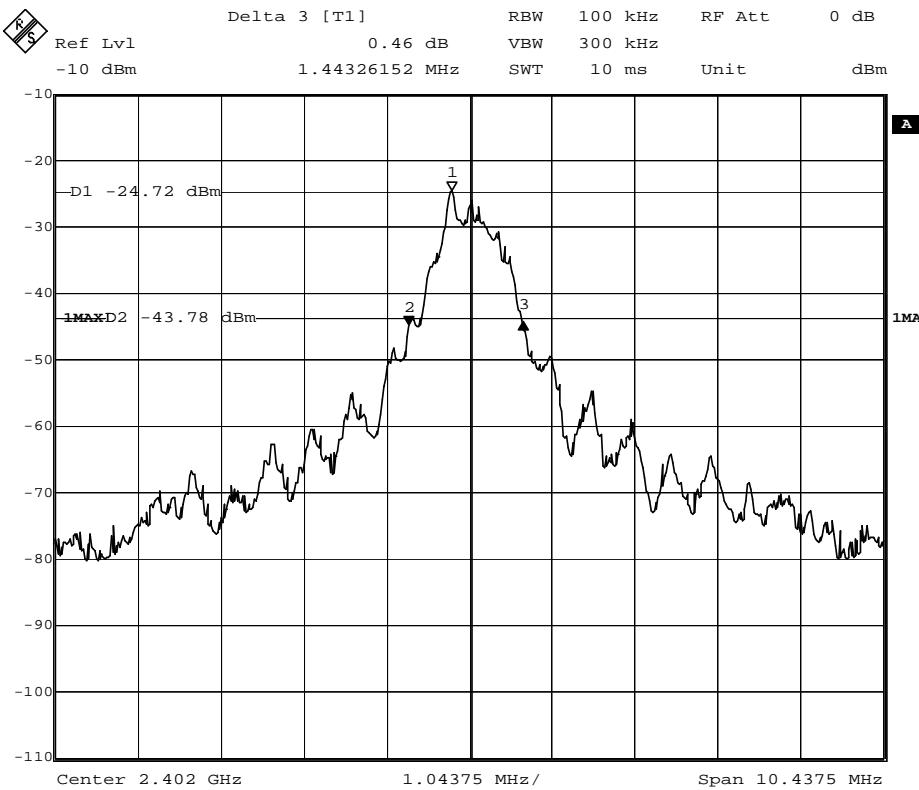
TEST RESULTS: The unit does meet the FCC requirements.

6.2.2 Occupied Bandwidth & Band Edge

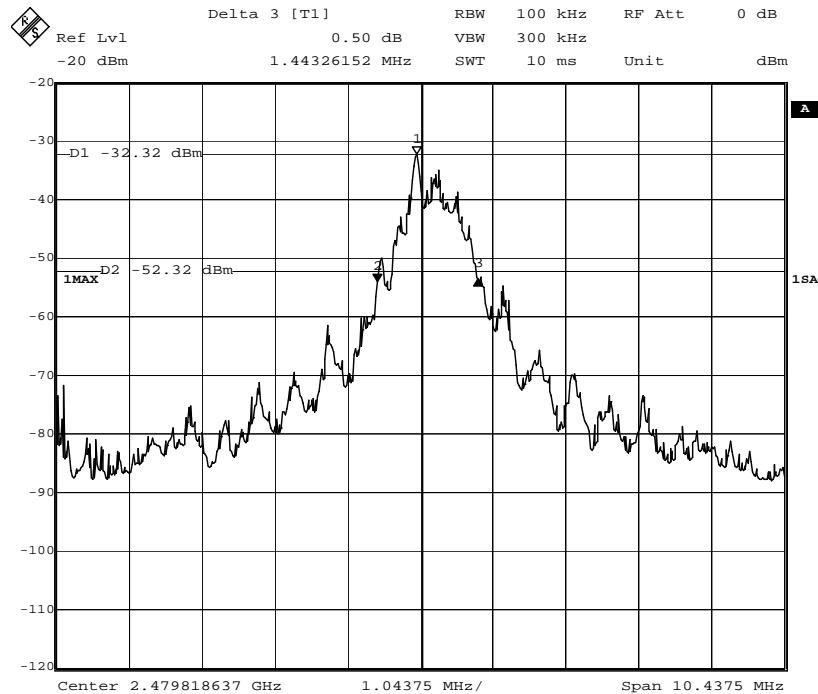
Test Requirement: FCC Part 15 C Section 15.249
Test Method: ANSI C63.4 and FCC Part 2.1049
Operation within the band 2400-2483.5MHz
Test Date: 09 July 2008
Requirements: 15.249 (d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.
Method of measurement: A small sample of the transmitter output was fed into the Spectrum Analyzer and the attached plot was taken.

For Controller:**The occupied bandwidth as below:**

Lowest Channel:2402MHz:



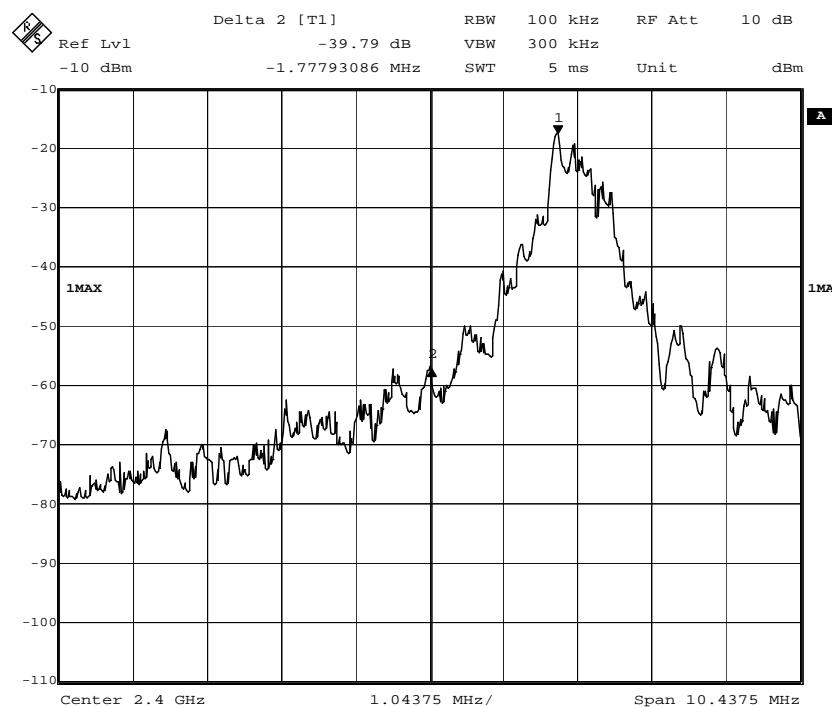
Highest Channel 2480MHz:



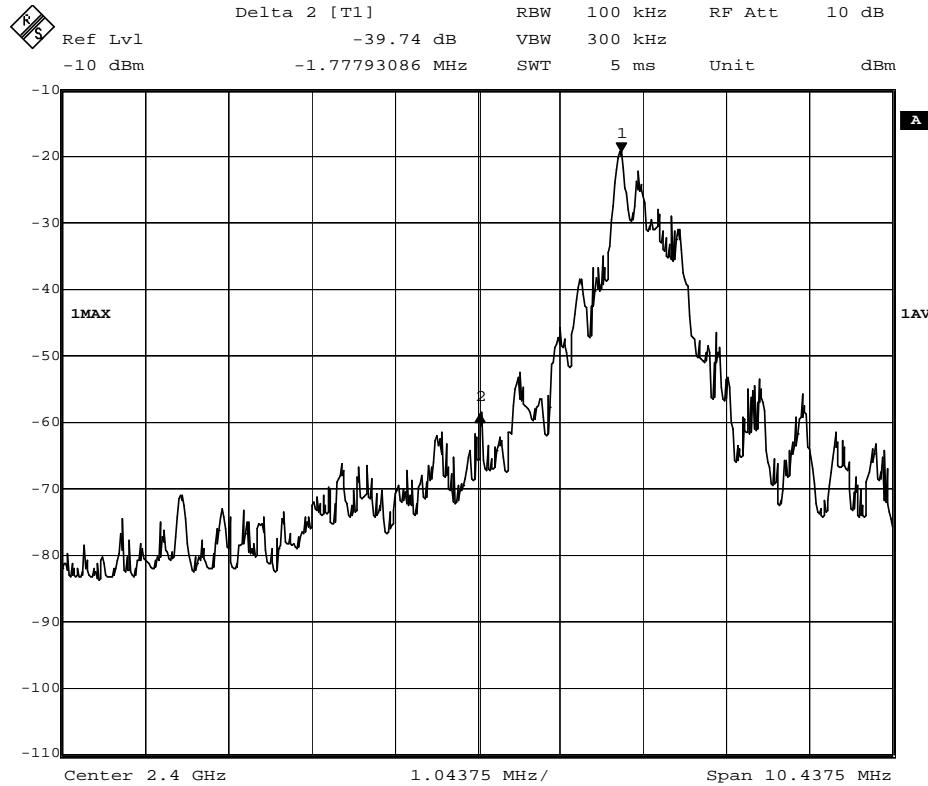
The Band Edge Emission as below:

Lowest Band Edge 2400MHz

Detector mode:Peak



Detector mode:Average

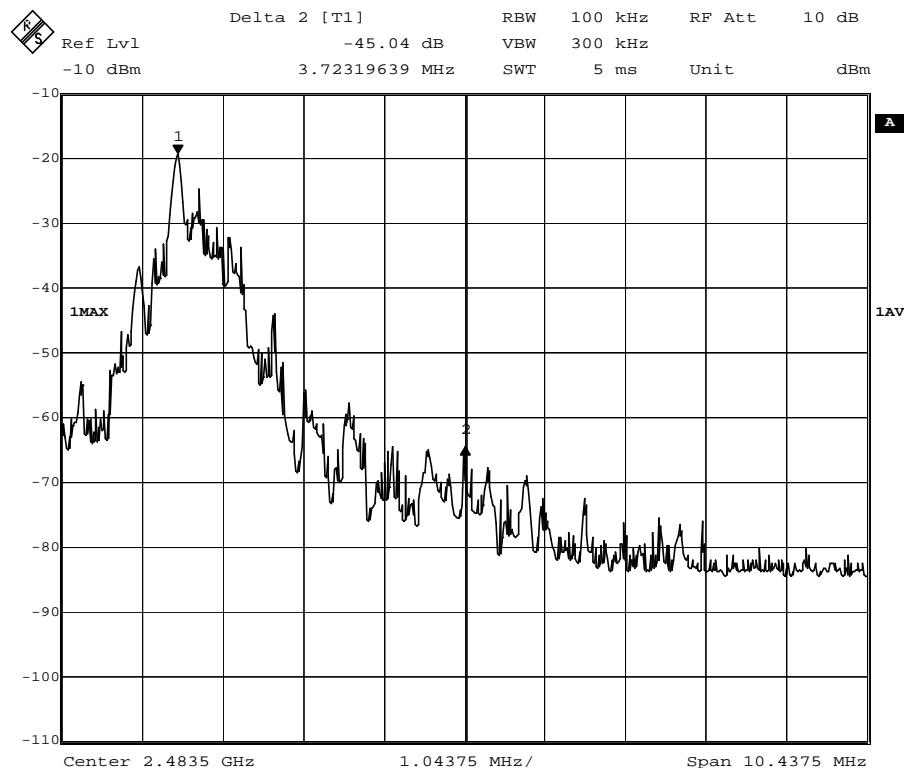


For 2400MHz bandedge checked with 2402MHz frequency operated, the delta shown at the plots are 39.79dB for peak detector mode and 39.74dB for Average detector mode.

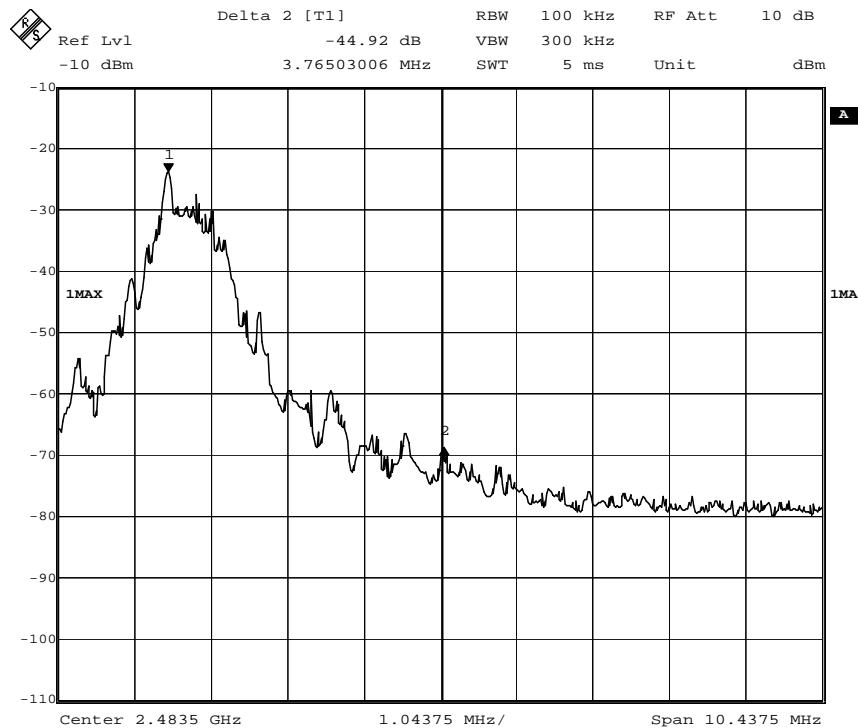
With the peak value 92.46dB_{uV/m} and average value at 91.47dB_{uV/m} presented at the report for the fundamental, the spurious emission level at 2400MHz were 52.67.0dB_{uV/m} for peak and 51.73dB_{uV/m} for average.

Highest Band Edge 2483.5MHz

Detector mode:Peak



Detector mode:Average



For 2483.5MHz bandedge checked with 2480MHz frequency operated, the delta shown at the plots are 45.04dB for peak detector mode and 44.92dB for Average detector mode.

With the peak value 91.99dBuV/m and average value at 90.93BuV/m presented at the report for the fundamental, the spurious emission level at 2483.5MHz were 46.95dBuV/m for peak and 46.01dBuV/m for average.

The test result for the Emissions radiated outside of the specified frequency bands , please refer to the section 6.2.1 of this report.

The results: The unit does meet the FCC requirements.

6.2.3 Conducted Emissions Mains Terminals, 150kHz to 30MHz

Test Requirement: FCC Part15.207
Test Method: ANSI C63.4
Test Date: July 10, 2008
Frequency Range: 150KHz to 30MHz
Detector: Peak for pre-scan (9kHz Resolution Bandwidth)
Quasi-Peak if maximised peak within 6dB of Quasi-Peak limit

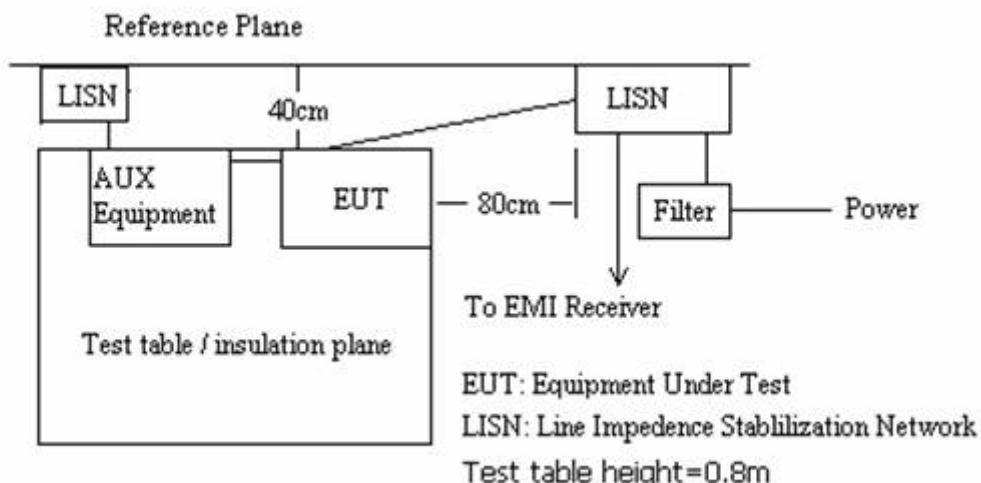
6.2.3.1 E.U.T. Operation

Operating Environment:

Temperature: 20.0 °C Humidity: 50 % RH Atmospheric Pressure: 1005 mbar

EUT Operation: Test the Host and Subwoofer in transmitting mode.

6.2.3.2 Plan View of Test Setup



6.2.3.3 Measurement Data

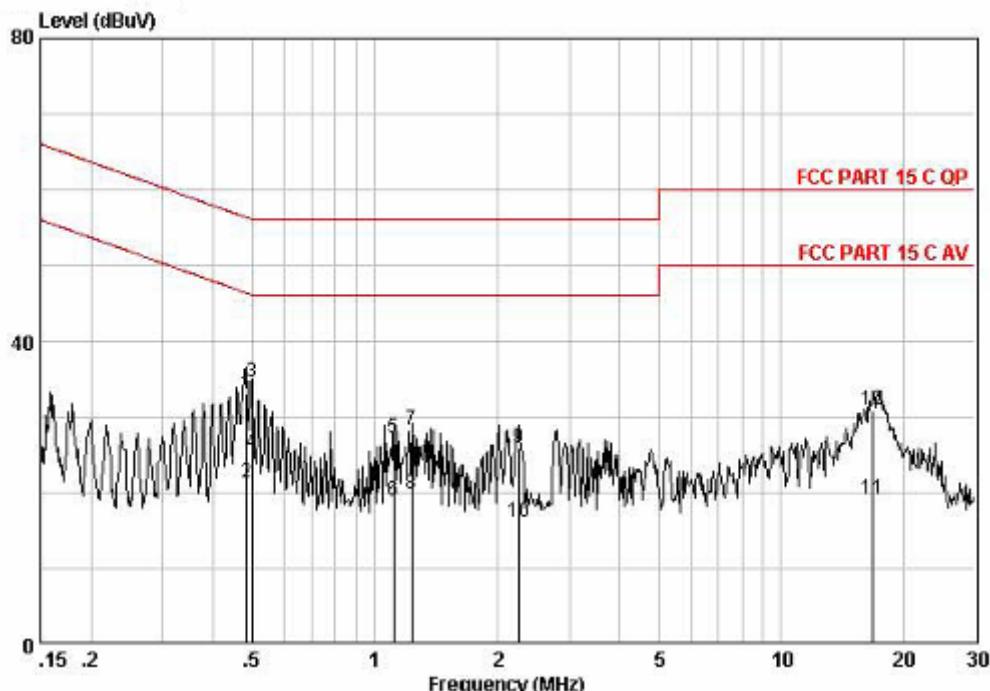
An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

The following Quasi-Peak and Average measurements were performed on the EUT on July 10, 2008

Live Line:

Peak Scan:

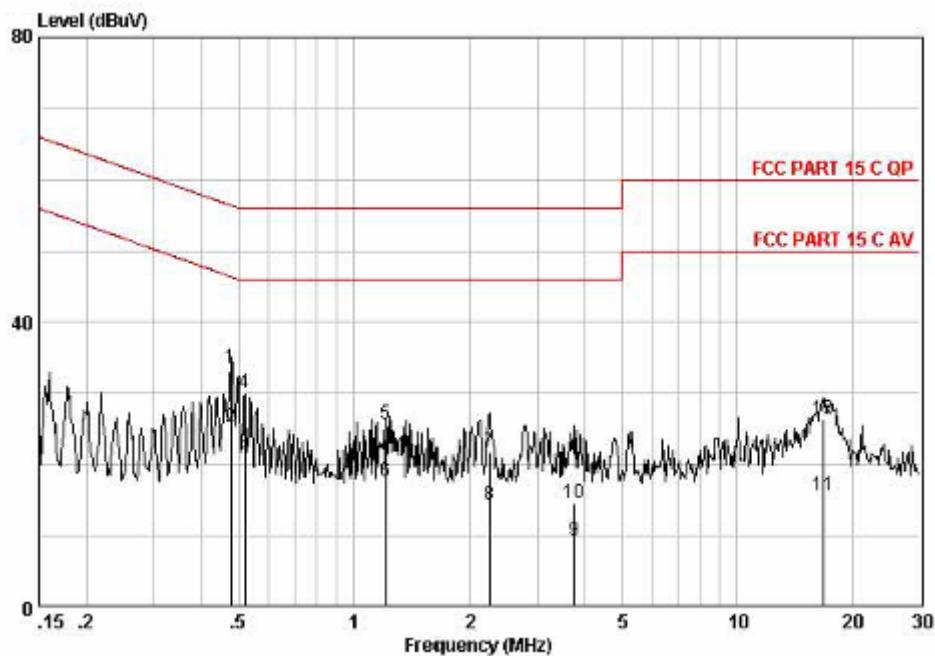


Quasi-peak and Average measurement:

Freq	Read	Cable	LISN	Limit	Over	Remark	
	Level	Loss	Factor				
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
0.484	23.10	0.00	9.95	33.05	56.27	-23.23	QP
0.484	11.34	0.00	9.95	21.29	46.27	-24.99	AVERAGE
0.499	24.74	0.00	9.95	34.69	56.01	-21.32	QP
0.499	15.35	0.00	9.95	25.30	46.01	-20.71	AVERAGE
1.117	17.50	0.01	9.78	27.29	56.00	-28.71	QP
1.117	9.19	0.01	9.78	18.98	46.00	-27.02	AVERAGE
1.236	18.64	0.01	9.78	28.43	56.00	-27.57	QP
1.236	10.07	0.01	9.78	19.86	46.00	-26.14	AVERAGE
2.249	16.24	0.04	9.74	26.02	56.00	-29.98	QP
2.249	6.46	0.04	9.74	16.24	46.00	-29.76	AVERAGE
16.839	9.09	0.18	9.90	19.17	50.00	-30.83	AVERAGE
16.839	20.84	0.18	9.90	30.92	60.00	-29.08	QP

Neutral Line

Peak Scan:



Quasi-peak and Average measurement:

Freq	Read	Cable	LISN	Limit	Over	Limit	Remark
	Level	Loss	Factor				
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
0.476	23.68	0.00	9.94	33.62	56.41	-22.79	QP
0.476	15.40	0.00	9.94	25.34	46.41	-21.07	AVERAGE
0.518	11.56	0.00	9.93	21.49	46.00	-24.51	AVERAGE
0.518	20.18	0.00	9.93	30.11	56.00	-25.89	QP
1.216	15.92	0.01	9.81	25.74	56.00	-30.26	QP
1.216	7.93	0.01	9.81	17.75	46.00	-28.25	AVERAGE
2.249	12.10	0.04	9.76	21.90	56.00	-34.10	QP
2.249	4.60	0.04	9.76	14.40	46.00	-31.60	AVERAGE
3.740	-0.48	0.06	9.73	9.31	46.00	-36.69	AVERAGE
3.740	4.78	0.06	9.73	14.57	56.00	-41.43	QP
16.750	5.62	0.18	9.91	15.71	50.00	-34.29	AVERAGE
16.750	16.32	0.18	9.91	26.41	60.00	-33.59	QP