STC Test Report

Date : 2008-05-13
No. : HM161611

Applicant (STE001): STORM ELECTRONICS CO., LTD.
22/F, COM WEB PLAZA, CHEUNG YUE ST., CHEUNG SHA WAN

Manufacturer: YUEHUA (ZHUHAI) ELECTRONIC CO., LTD.
13, NO. 4 PING DONG ROAD, NANPING TECHNOLOGY DISTRICT, ZHUHAI, GD, CHINA 519060

Description of Samples:

Product:	PS3 Blue Tooth Headset
Brand Name:	KATAWA GAME ACCESSORIES INC.
Model Number:	P5HM-001
FCC ID:	VU5P5HM-001

Date Samples Received: 2008-04-22

Date Tested: 2008-05-03

Investigation Requested: Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2007 and ANSI C63.4:2003 for FCC Certification.

Conclusions: The submitted product COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.

Remarks: ---

Dr. LEE Kam Chuen,
ElectroMagnetic Compatibility Department
For and on behalf of
The Hong Kong Standards and Testing Centre Ltd.

The Hong Kong Standards and Testing Centre Ltd.
10 Dai Wang Street, Taipo Industrial Estate, N.T., Hong Kong
Tel: (852) 2666 1888 Fax: (852) 2664 4353 Homepage: www.hkstc.org E-mail: hkstc@hkstc.org

CONTENT:

1.0 General Details

1.1 Test Laboratory

The Hong Kong Standards and Testing Centre Ltd.
EMC Laboratory
10 Dai Wang Street, Taipo Industrial Estate
New Territories, Hong Kong

1.2 Applicant Details

Applicant

STORM ELECTRONICS CO., LTD.
22/F, COM WEB PLAZA, CHEUNG YUE ST., CHEUNG SHA WAN

Manufacturer

YUEHUA (ZHUHAI) ELECTRONIC CO., LTD.
13, NO. 4 PING DONG ROAD, NANPING TECHNOLOGY DISTRICT, ZHUHAI, GD, CHINA 519060

1.3 Equipment Under Test [EUT]

Description of Sample

Product:	PS3 Blue Tooth Headset
Manufacturer:	YUEHUA (ZHUHAI) ELECTRONIC CO., LTD.
Brand Name:	KATAWA GAME ACCESSORIES INC.
Model Number:	P5HM-001
Input Voltage:	4.1Vd.c. (Rechargeable battery x 1)

1.3.1 Description of EUT Operation

The Equipment Under Test (EUT) is a Storm Electronics Co., Ltd., PS3 Blue Tooth Headset; the transmission signal is frequency hopping with channel frequency 2.402-2.480GHz.
The system is based on two-way wireless digital audio transfer between a Bluetooth enable device. The application consists of an Atx (audio source) and an Arx (audio receiver) Atx unit connects to an audio source (microphone). Arx unit is used for connect to headphone.

1.4 Date of Order

2008-04-22

1.5 Submitted Sample(s):

1 Sample

1.6 Test Duration

2008-05-03

1.7 Country of Origin

China

2.0 Technical Details

2.1 Investigations Requested

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2007 Regulations and ANSI C63.4:2003 for FCC Certification.

2.2 Test Standards and Results Summary Tables

EMISSION
Results Summary

Test Condition	Test Requirement	Test Method	Class / Severity	Test Result		
				Pass	Fail	N/A
Output Power of Fundamental & Harmonics Emissions	FCC 47CFR 15.247	ANSI C63.4:2003	N/A	☒	☐	☐
Radiated Emissions	FCC 47CFR 15.209	ANSI C63.4:2003	N/A	☒	☐	☐
Conducted Emissions on AC, 0.15MHz to 30MHz	FCC 47CFR 15.207	ANSI C63.4:2003	N/A	☒	☐	☐
Number of Operating Frequency	FCC 47CFR 15.3(m)	N/A	N/A	☒	☐	☐
Channel Separation	FCC 47CFR 15.247(a)(1)	N/A	N/A	☒	☐	☐
Pseudorandom Hopping Algorithm	FCC 47CFR 15.247(a)(1)	N/A	N/A	☒	☐	☐
Time of Occupancy	FCC 47CFR 15.247(a)(1)(iii)	N/A	N/A	☒	☐	☐
Bandwidth	FCC 47CFR 15.247(a)(2)	N/A	N/A	☒	☐	☐
Power Density	FCC 47CFR 15.247(b)(5)	N/A	N/A	☒	☐	☐
Antenna requirement	FCC 47CFR 15.203	N/A	N/A	☒	☐	☐

Note: N/A - Not Applicable

3.0 Test Results

3.1 Emission

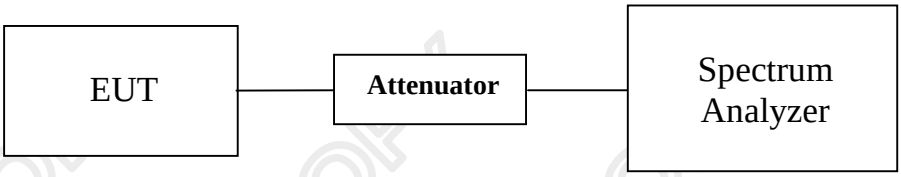
3.1.1 Maximum Peak Output Power

Test Requirement:	FCC 47CFR 15.247
Test Method:	N/A
Test Date:	2008-05-03
Mode of Operation:	Communication mode

Test Method:

The transmitter output was connected to the spectrum / receiver through an attenuator. The center frequency of the spectrum analyzer is set to the fundamental frequency and using 1MHz RBW and 1MHz VBW. Use Peak Search to read the peak power after Maximum Hold function is activated.

Test Setup:



Limits for Peak Output Power of Fundamental & Harmonics Emissions [FCC 47CFR 15.247]:

The maximum peak output power shall not exceeded the following limits: For frequency hopping systems employing at least 75 hopping channels: 1 Watt Fo all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 Watts Fo Digital Transmission systems in 2400-2483.5 MHz Band: 1 Watt

Results of transmission Mode (2.402GHz to 2.480GHz) : Pass (TX Unit)
Maximum Conducted Peak Output Power

Transmission Frequency (MHz)	Transmitter power (Watts)
2402	1.13mW

Transmission Frequency (MHz)	Transmitter power (Watts)
2462	3.40mW

Transmission Frequency (MHz)	Transmitter power (Watts)
2480	3.32mW

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB
1GHz to 18GHz 5.1dB

Antenna gain = 10*log (EIRP/ conducted power) dBi

Transmission Frequency (MHz)	2402	2462	2480
Antenna gain (dBi)	2	2	2

3.1.2 Radiated Emissions

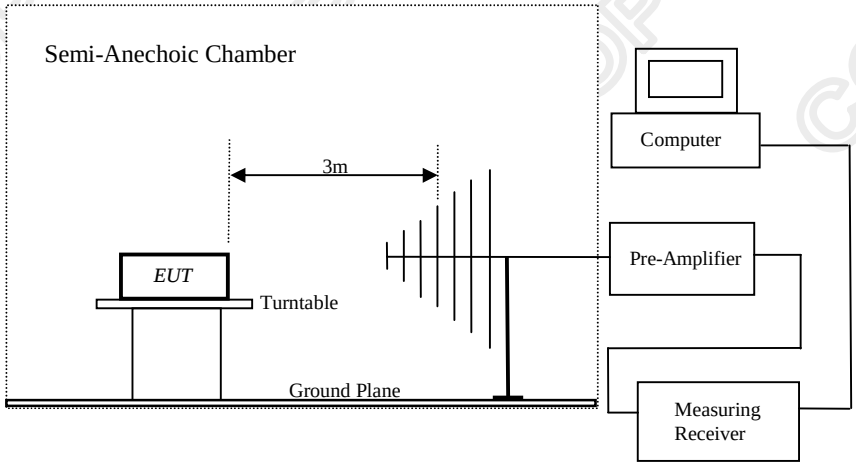
Test Requirement:	FCC 47CFR 15.209
Test Method:	ANSI C63.4:2003
Test Date:	2008-05-03
Mode of Operation:	Communication mode

Test Method:

The sample was placed 0.8m above the ground plane of semi-anechoic Chamber*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

* Semi-anechoic chamber located on the G/F of "The Hong Kong Standards and Testing Centre Ltd." with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 607756.

Test Setup:



Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

Frequency Range [MHz]	Quasi-Peak Limits [μV/m]
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Result of Communication Mode (2402MHz): Pass

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
2402.0	54.6	29.1	83.7	15,310.9	495,450	Horizontal
* 4804.0	**No Emission Detected**				5,000	Vertical
7206.0					5,000	Vertical
9608.0					5,000	Vertical
* 12010.0					5,000	Vertical
14412.0					5,000	Vertical
16814.0					5,000	Vertical
* 19216.0					5,000	Vertical
21618.0					5,000	Vertical
24020.0					5,000	Vertical

Remarks:

* Denotes restricted band of operation.
Measurements were made using a peak detector. Any emission less than 1000MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB
1GHz to 18GHz 5.1dB

Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

Frequency Range [MHz]	Quasi-Peak Limits [μV/m]
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Result of Communication Mode (2402MHz): Pass

Field Strength of Fundamental Emissions Average Value						
Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
2402.0	41.2	29.1	70.3	3,273.4	49,545.0	Horizontal
* 4804.0	**No Emission Detected**				500	Vertical
7206.0					500	Vertical
9608.0					500	Vertical
* 12010.0					500	Vertical
14412.0					500	Vertical
16814.0					500	Vertical
* 19216.0					500	Vertical
21618.0					500	Vertical
24020.0					500	Vertical

Remarks:

* Denotes restricted band of operation.
Measurements were made using a peak detector. Any emission less than 1000MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB
1GHz to 18GHz 5.1dB

Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

Frequency Range [MHz]	Quasi-Peak Limits [μV/m]
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Result of Communication Mode (2462MHz): Pass

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
2462.0	59.1	29.4	88.5	26,607.3	495,450	Horizontal
* 4924.0	**No Emission Detected**				5,000	Vertical
7386.0					5,000	Vertical
9848.0					5,000	Vertical
* 12310.0					5,000	Vertical
14772.0					5,000	Vertical
17234.0					5,000	Vertical
* 19696.0					5,000	Vertical
22158.0					5,000	Vertical
24620.0					5,000	Vertical

Remarks:

* Denotes restricted band of operation.
Measurements were made using a peak detector. Any emission less than 1000MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB
1GHz to 18GHz 5.1dB

Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

Frequency Range [MHz]	Quasi-Peak Limits [μV/m]
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Result of Communication Mode (2462MHz): Pass

Field Strength of Fundamental Emissions Average Value						
Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
2462.0	43.0	29.4	72.4	4,168.7	49,545.0	Horizontal
* 4924.0	**No Emission Detected**				500	Vertical
7386.0					500	Vertical
9848.0					500	Vertical
* 12310.0					500	Vertical
14772.0					500	Vertical
17234.0					500	Vertical
* 19696.0					500	Vertical
22158.0					500	Vertical
24620.0					500	Vertical

Remarks:

* Denotes restricted band of operation.
Measurements were made using a peak detector. Any emission less than 1000MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB
1GHz to 18GHz 5.1dB

Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

Frequency Range [MHz]	Quasi-Peak Limits [μV/m]
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Result of Communication Mode (2480MHz): Pass

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
2480.0	58.5	29.9	88.4	26,302.7	495,450.2	Horizontal
* 4960.0	**No Emission Detected**				5,000	Vertical
7440.0					5,000	Vertical
9920.0					5,000	Vertical
* 12400.0					5,000	Vertical
14880.0					5,000	Vertical
17360.0					5,000	Vertical
* 19840.0					5,000	Vertical
22320.0					5,000	Vertical
24800.0					5,000	Vertical

Remarks:

* Denotes restricted band of operation.
Measurements were made using a peak detector. Any emission less than 1000MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB
1GHz to 18GHz 5.1dB

Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

Frequency Range [MHz]	Quasi-Peak Limits [μV/m]
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Result of Communication Mode (2480MHz): Pass

Field Strength of Fundamental Emissions Average Value						
Frequency MHz	Measured Level @3m dBμV/m	Correction Factor dBμV/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
2480.0	41.6	29.9	71.5	3,758.4	49,545.0	Horizontal
* 4960.0	**No Emission Detected**				500	Vertical
7440.0					500	Vertical
9920.0					500	Vertical
* 12400.0					500	Vertical
14880.0					500	Vertical
17360.0					500	Vertical
* 19840.0					500	Vertical
22320.0					500	Vertical
24800.0					500	Vertical

Remarks:

* Denotes restricted band of operation.
Measurements were made using a peak detector. Any emission less than 1000MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB
1GHz to 18GHz 5.1dB

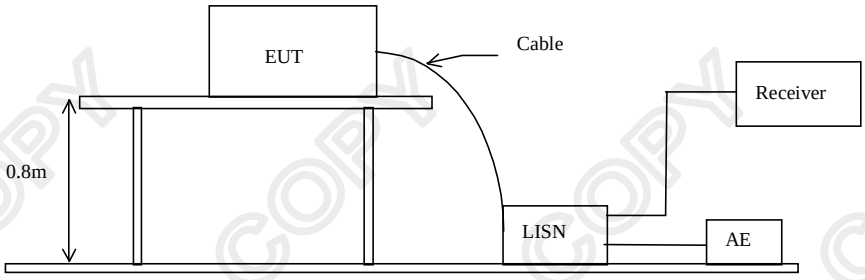
3.2 Conducted Emissions (0.15MHz to 30MHz)

Test Requirement:	FCC 47CFR 15.207
Test Method:	ANSI C63.4:2003
Test Date:	2008-04-29
Mode of Operation:	Charge mode connected to PC

Test Method:

The test was performed in accordance with ANSI C63.4: 2003, with the following: an initial measurement was performed in peak and average detection mode on the live line, any emissions recorded within 30dB of the relevant limit line were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.

Test Setup:



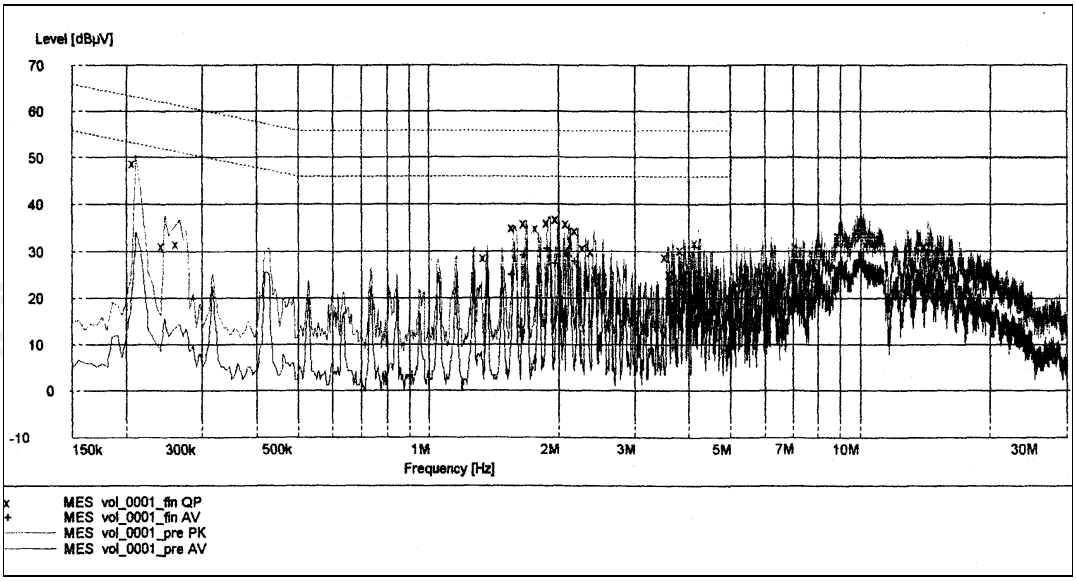
Limit for Conducted Emissions (FCC 47 CFR 15.207):

Frequency Range [MHz]	Quasi-Peak Limits [dBµV]	Average [dBµV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* Decreases with the logarithm of the frequency.

Limits for Conducted Emissions Test, please refer to limit lines (Quasi-Peak and Average) in the following diagram.

Results of Charge mode connected to PC: PASS



Remark:
Calculated measurement uncertainty: 3.97dB

3.3 Frequency Range Measurement

Test Requirement:	FCC 47CFR 15.247
Test Method:	ANSI C63.4:2003
Test Date:	2008-05-03
Mode of Operation:	On Mode

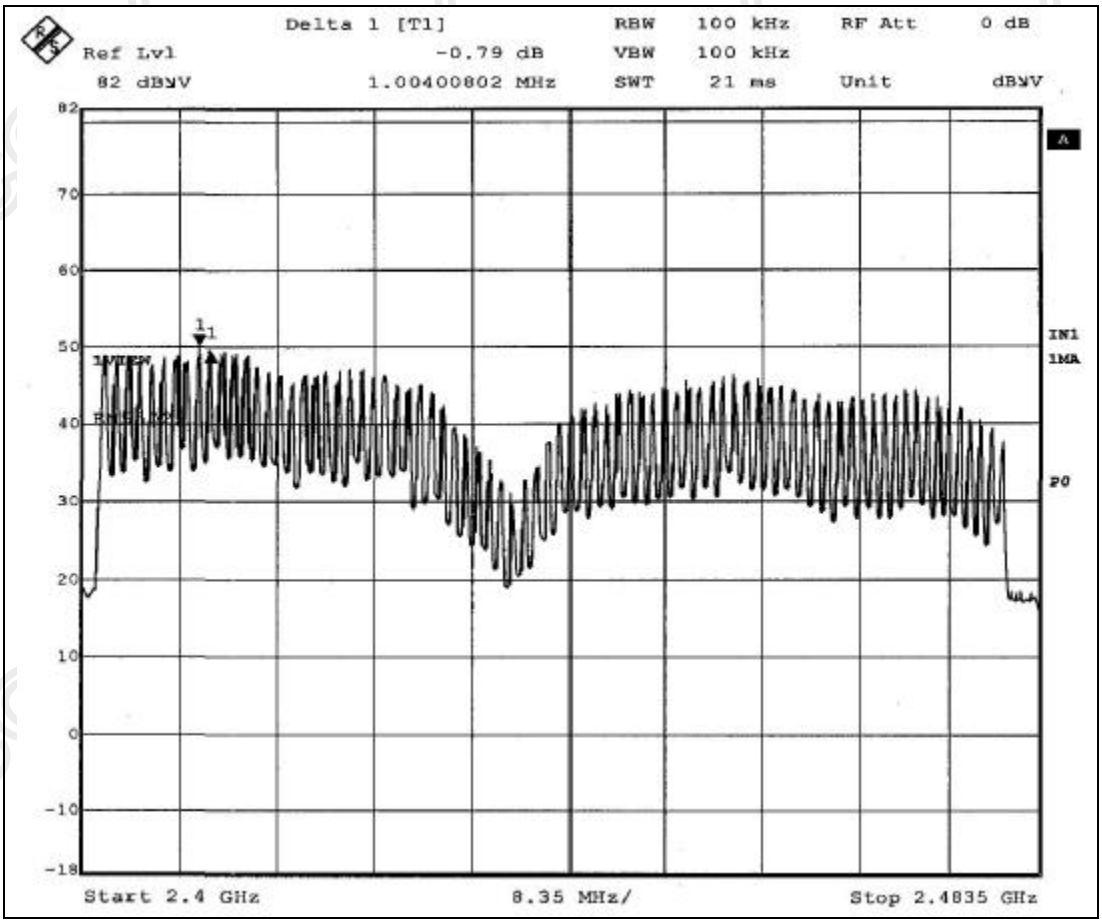
Test Method:

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

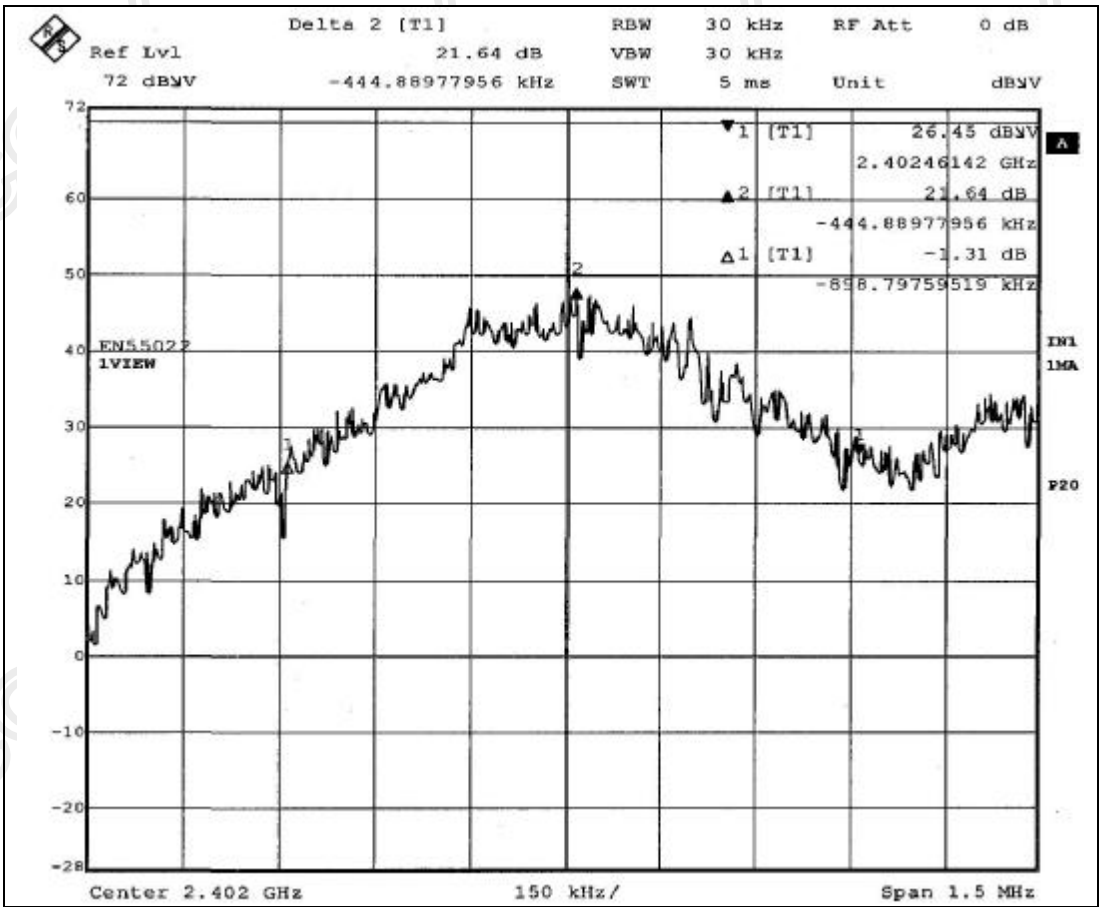
Test Setup:

As Test Setup of clause 3.1.1 in this test report.

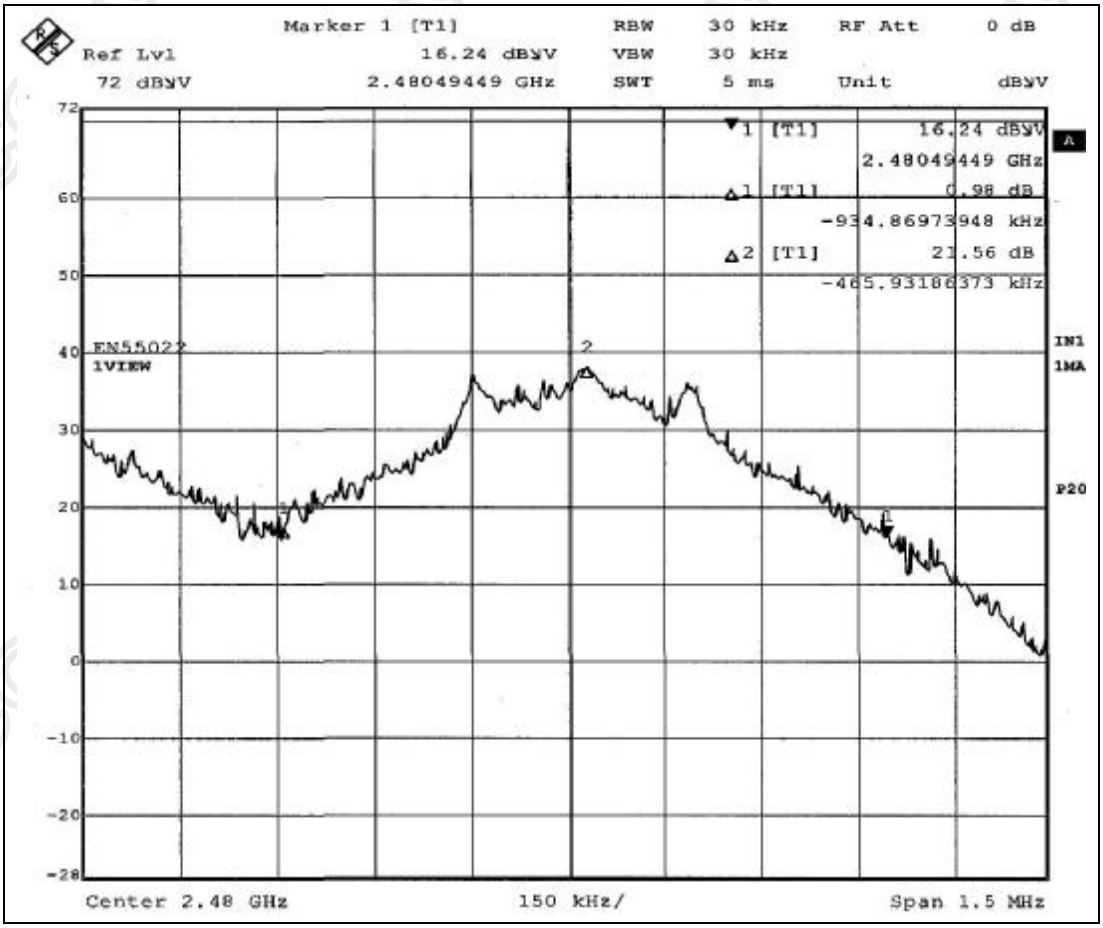
Channel Separation & RF Channels in use



20dB Bandwidth – 2402MHz



20dB Bandwidth – 2479MHz



Antenna Requirement

Test Requirements: § 15.203

Test Specification:

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 shall be considered sufficient to comply with the provisions of this section. 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.

Test Results:

The EUT Antenna is permanently attached to the main unit and attached on PCB board. All component install on inside of EUT. User unable to remove or changed the Antenna.

Occupancy Time

Requirements:

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channel employed.
No requirements for Digital Transmission System.

Measurement Data: Number of RF channel: 79
Observed duration of occupancy = 0.4s x 79 = 31.6s
Occupancy of channel = 138.36 ms
Number of burst 23
Burst Duration = 0.38076ms

Time of occupancy: ((23 x 0.38076) / 2 x 31600 = 0.138.36ms < 0.4s

See fig. A and B.

Number of RF Burst (23 Burst)

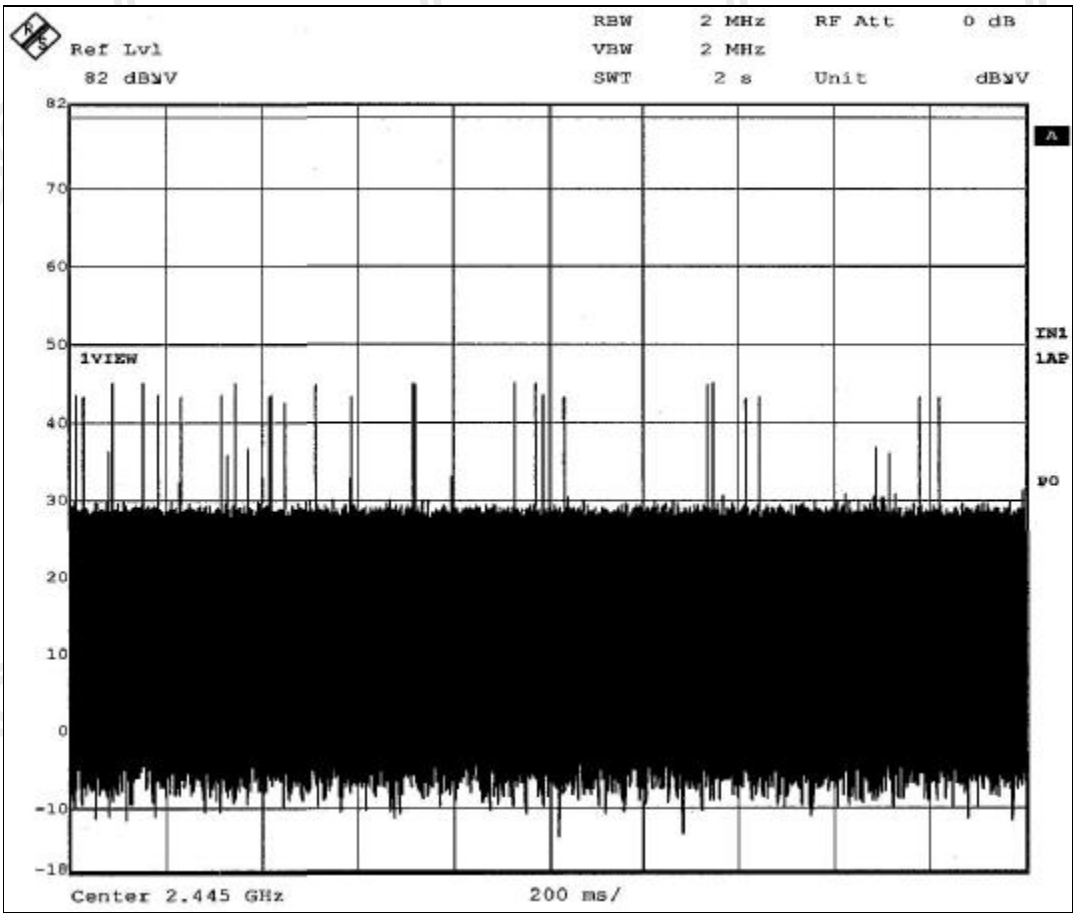
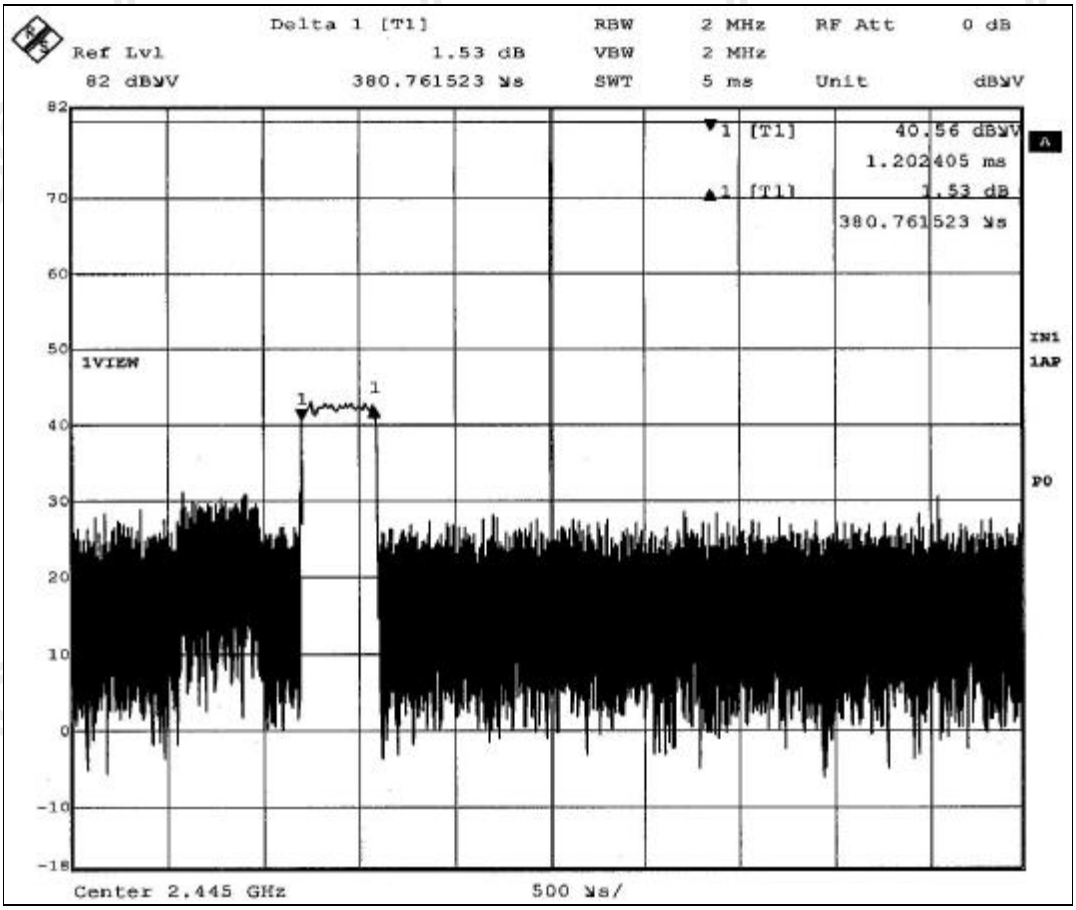


Fig B. RF Burst Duration



RF Exposure

Test Requirements:	**§ 15.247 (b)(5); § 1.1307 (b)(1)**	
Test Specification:	Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines.	
Test Results:	The EUT complied with the requirement(s) of the section. EUT meets the requirements of these sections as proven through MPE calculation.	
	The MPE calculation for EUT @ 20cm Based on the highest P = 3.4mW	
	Pd = PG/4pi*R^2	= (3.4x1.58)/12.566* $(20)^2$
		= 2.372/5026.55
		= 0.0011 mW/cm^2

Where:	*Pd = power density in mW/cm^2 * G = Antenna numeric gain (1.58); Log G = g/10 (g = 2) * P = Conducted RF power to antenna (3.4mW) * R = Minimum allowable distance (20cm)
	* The power density Pd = 0.02mW/cm^2 is less than 1mW/cm^2 (listed MPF limit) * The SAR evaluation is not needed (this is a desk top device, R > 20cm) * The EUT (antenna) must be 0.2 meters away from the General Population.

Appendix A

List of Measurement Equipment

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM215	MULTIDEVICE CONTROLER	EMCO	2090	00024676	N/A	N/A
EM216	MINI MAST SYSTEM	EMCO	2075	00026842	N/A	N/A
EM217	ELECTRIC POWERED TURNTABLE	EMCO	2088	00029144	N/A	N/A
EM218	ANECHOIC CHAMBER	ETS-Linggren	FACT-3	--	2006/05/02	2009/05/02
EM219	BICONILOG ANTENNA	EMCO	3142C	00029071	2006/08/23	2008/08/23
EM229	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB40	100248	2007/07/20	2008/08/20

Line Conducted

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM119	LISN	ROHDE & SCHWARZ	ESH3-Z5	0831.5518.52	2007/07/30	2008/07/30
EM229	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB40	100248	2007/07/20	2008/08/20
EM154	SHIELDING ROOM	SIEMENS MATSUSHITA COMPONENTS	N/A	803-740-057-99A	2008/01/23	2009/01/23

Remarks:-

CM Corrective Maintenance
N/A Not Applicable or Not Available
TBD To Be Determined

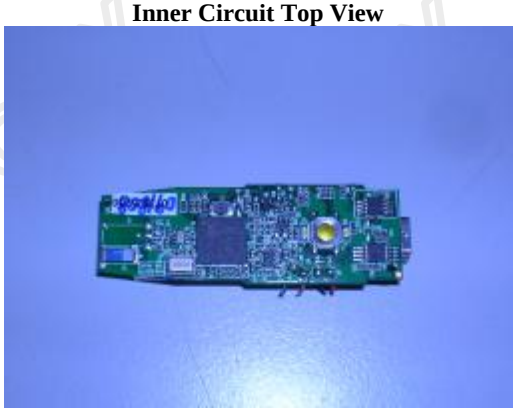
Appendix B

Photographs of EUT

Front View of the product

Rear View of the product

Inner Circuit Top View



Inner Circuit Bottom View

Photographs of EUT

Measurement of Radiated Emission Test Set Up

Measurement of Conducted Emission Test Set Up

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