

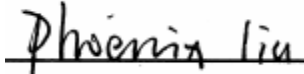

FCC PART 15.249 MEASUREMENT AND TEST REPORT

For

**Swann Communications Pty Ltd
(Swann Global Limited - HK office)**

Room 1601, Tung Ning Building, 249-255 Des Voeux Rd, Central, Hong Kong

FCC ID: VMIWMX001

This Report Concerns: <input checked="" type="checkbox"/> Original Report	Equipment Type: Wired/Wireless Maxi-Brite
Test Engineer:	Phoenix Liu 
Report No.:	RSZ07091052
Test Date:	2007-10-15 to 2007-10-16
Report Date:	2007-10-24
Reviewed By:	EMC Manager: Boni Baniqued 
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Note: This test report is for the customer shown above and their specific product only. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratory Corp. (Shenzhen) This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

TABLE OF CONTENTS

GENERAL INFORMATION.....	3
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	3
OBJECTIVE	3
RELATED SUBMITTAL(S)/GRANT(S).....	3
TEST METHODOLOGY	3
TEST FACILITY	4
SYSTEM TEST CONFIGURATION.....	5
JUSTIFICATION	5
EQUIPMENT MODIFICATIONS	5
HOST SYSTEM CONFIGURATION LIST AND DETAILS	5
EXTERNAL I/O CABLE.....	5
CONFIGURATION OF TEST SETUP	5
BLOCK DIAGRAM OF TEST SETUP	6
SUMMARY OF TEST RESULTS	7
§15.203 - ANTENNA REQUIREMENT.....	8
APPLICABLE STANDARD	8
ANTENNA CONNECTOR CONSTRUCTION	8
§15.207 - CONDUCTED EMISSIONS	9
MEASUREMENT UNCERTAINTY	9
EUT SETUP	9
EMI TEST RECEIVER SETUP.....	10
TEST EQUIPMENT LIST AND DETAILS.....	10
TEST PROCEDURE	10
TEST RESULTS SUMMARY	10
TEST DATA	11
PLOT(S) OF TEST DATA	11
§15.205(A) §15.209(A) §15.249(A) §15.249(D) - RADIATED EMISSIONS.....	14
APPLICABLE STANDARD	14
MEASUREMENT UNCERTAINTY	14
TEST EQUIPMENT SETUP.....	14
EUT SETUP	15
TEST EQUIPMENT LIST AND DETAILS.....	15
TEST PROCEDURE	16
CORRECTED AMPLITUDE & MARGIN CALCULATION	16
TEST RESULTS SUMMARY	16
TEST DATA	17
§15.249(D) – OUT OF BAND EMISSIONS	19
APPLICABLE STANDARD	19
TEST PROCEDURE	19
TEST EQUIPMENT LIST AND DETAILS.....	19
TEST DATA	19

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Swann Communications Pty Ltd (Swann Global Limited - HK office)*'s product, model number: *WMX* the "EUT" as referred to in this report is a *Wired/Wireless Maxi-Brite*, which measures approximately 6.5cmL x 13.5cmW x 20.0cmH, rated input voltage: DC 12V adapter.

AC/DC Adapter:

Model: KSAFC120050W1US;

Input: 100-240V 50/60 Hz 0.18A;

Output: 12V 500 mA.

* All measurement and test data in this report was gathered from production sample serial number: 0709005 (Assigned by BACL, Shenzhen). The EUT was received on 2007-09-10.

Objective

This Type approval report is prepared on behalf of *Swann Communications Pty Ltd (Swann Global Limited - HK office)* in accordance with Part 2, Subpart J, and Part 15, Subparts A, B and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.249 rules.

Related Submittal(s)/Grant(s)

No Related Submittals.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Laboratory Corp. (Shenzhen) to collect test data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone, ShenZhen, Guangdong 518038, P.R. of China.

Test site at Bay Area Compliance Laboratory Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 04, 2004. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179 and Industrial Canada registration test site No.: 5500A. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratory Corp. (Shenzhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0).



NVLAP LAB CODE 200707-0

The current scope of accreditations can be found at
<http://ts.nist.gov/Standards/scopes/2007070.htm>

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

Equipment Modifications

Bay Area Compliance Laboratories Corp. (Shenzhen) has not done any modification on the EUT.

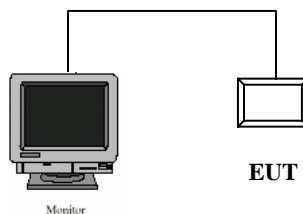
Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
SAMSUNG	Monitor	Sumsung 225ms	N/A	DoC

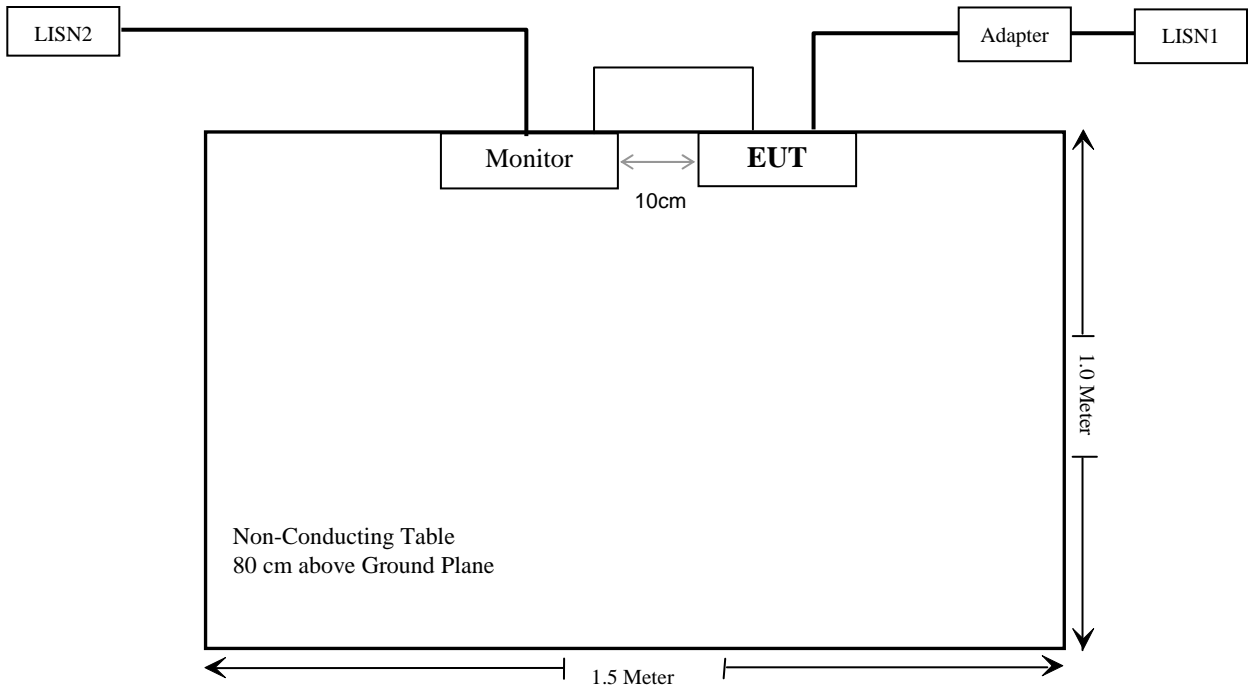
External I/O Cable

Cable Description	Length (M)	From/Port	To
Unshielded Detachable DC Power Cable	1.80	EUT	Adapter
Unshielded Detachable AV Cable	1.50	EUT	Monitor

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.203	Antenna Requirement	Compliant
§15.207(a)	Conduction Emissions	Compliant
§15.205(a), §15.209(a), 15.249(a), §15.249(c)	Radiated Emissions	Compliant
§15.249(d)	Out of Band Emissions	Compliant

§15.203 - ANTENNA REQUIREMENT

Applicable Standard

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used.

Antenna Connector Construction

The EUT antenna is a permanently attached wire omni-directional antenna, which in accordance to section 15.203, is considered sufficient to comply with the provisions of this section.

Result: Compliant.

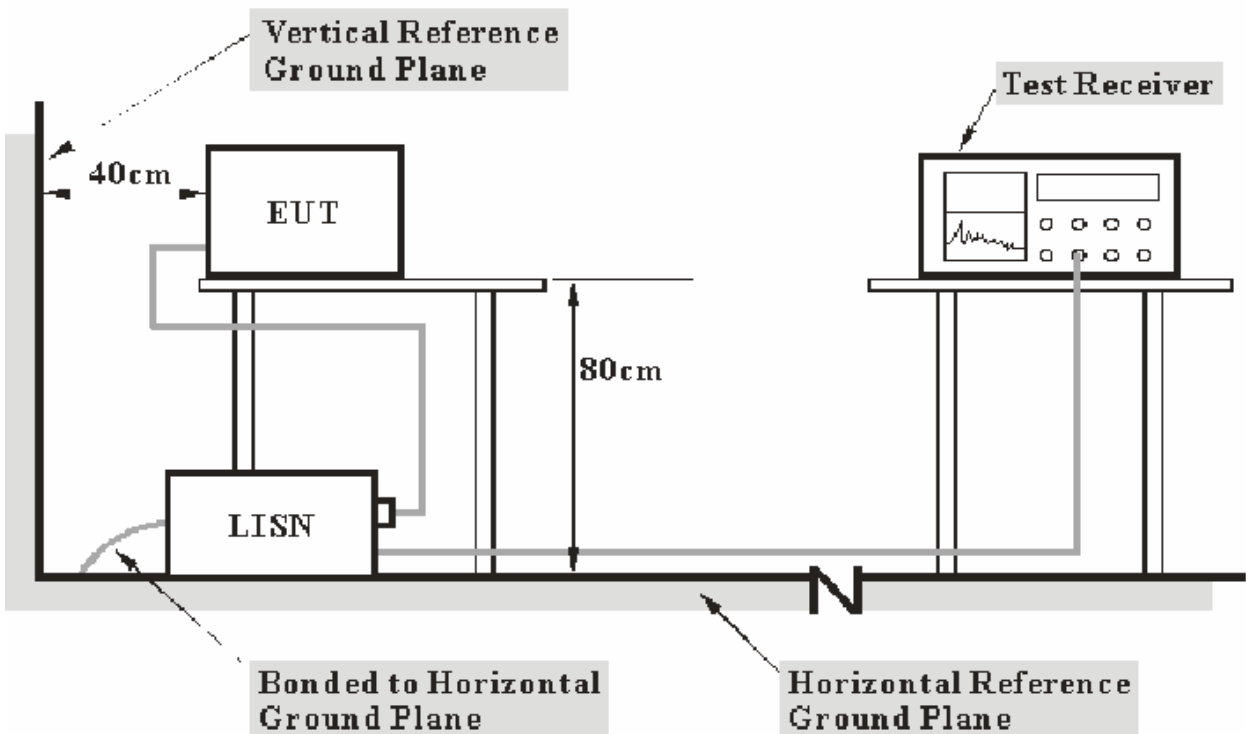
§15.207 - CONDUCTED EMISSIONS

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is ± 2.4 dB.

EUT Setup



- Note:**
1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15 .207 limits.

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120 VAC/60 Hz power source.

EMI Test Receiver Setup

The test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

<i>Frequency Range</i>	<i>IFBW</i>
150 kHz – 30 MHz	9 kHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Com-Power	L.I.S.N.	LI-200	12005	N/A	N/A
Com-Power	L.I.S.N.	LI-200	12208	N/A	N/A
Rohde & Schwarz	EMI Test Receiver	ESCS30	DE25330	2007-03-26	2008-03-26
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2007-03-26	2008-03-26

* Com-Power's LISN were used as the supporting equipment.

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the first LISN, and the monitor was connected to the outlet of the second LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207, with the worst margin reading of:

15.90 dB at 0.150 MHz in the **Live** conductor mode.

Test Data**Environmental Conditions**

Temperature:	26 ° C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Phoenix Liu on 2007-10-15.

Test Mode: Transmitting

Line Conducted Emissions				FCC PART 15 .207	
Frequency (MHz)	Amplitude (dB μ V)	Detector (QP/AV)	Phase (Live/Neutral)	Limit (dB μ V)	Margin (dB)
0.150	50.10	QP	Live	66.00	15.90
24.240	42.90	QP	Live	60.00	17.10
0.160	47.50	QP	Neutral	65.50	18.00
0.385	39.00	QP	Neutral	58.30	19.30
0.270	41.30	QP	Live	61.10	19.80
0.385	27.70	AV	Neutral	48.30	20.60
1.930	35.10	QP	Neutral	56.00	20.90
4.300	25.00	AV	Neutral	46.00	21.00
1.930	24.70	AV	Neutral	46.00	21.30
2.560	34.60	QP	Neutral	56.00	21.40
4.300	34.30	QP	Neutral	56.00	21.70
2.685	34.10	QP	Live	56.00	21.90
2.560	23.80	AV	Neutral	46.00	22.20
0.560	33.20	QP	Neutral	56.00	22.80
1.125	33.10	QP	Live	56.00	22.90
2.685	23.10	AV	Live	46.00	22.90
0.560	21.40	AV	Neutral	46.00	24.60
6.880	24.80	AV	Live	50.00	25.20
1.125	19.50	AV	Live	46.00	26.50
0.270	24.40	AV	Live	51.10	26.70
6.880	32.40	QP	Live	60.00	27.60
0.160	27.80	AV	Neutral	55.50	27.70
0.150	22.00	AV	Live	56.00	34.00
24.240	14.60	AV	Live	50.00	35.40

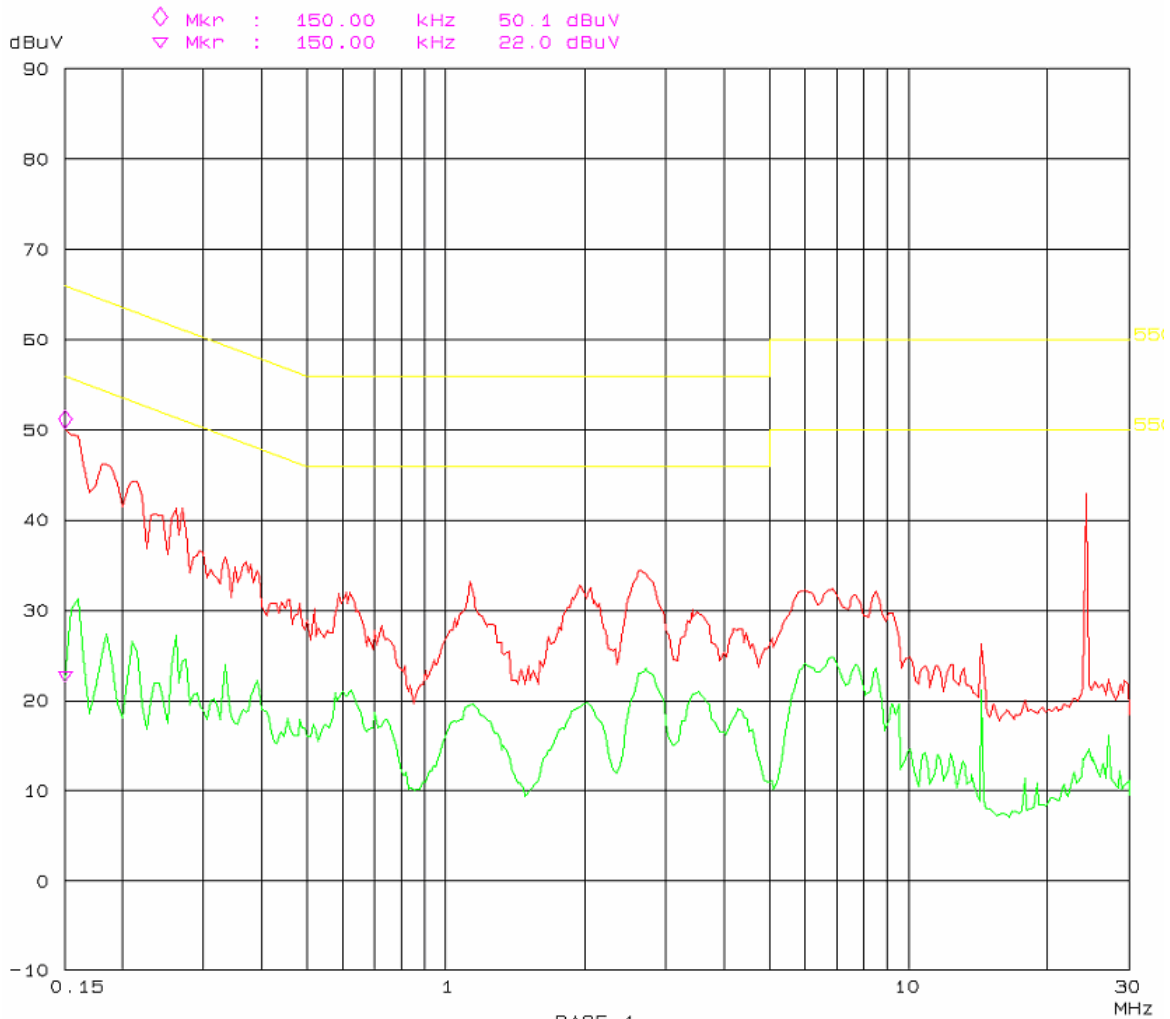
Plot(s) of Test Data

Plot(s) of Test Data is presented hereinafter as reference.

Conducted Emission Test FCC PART 15

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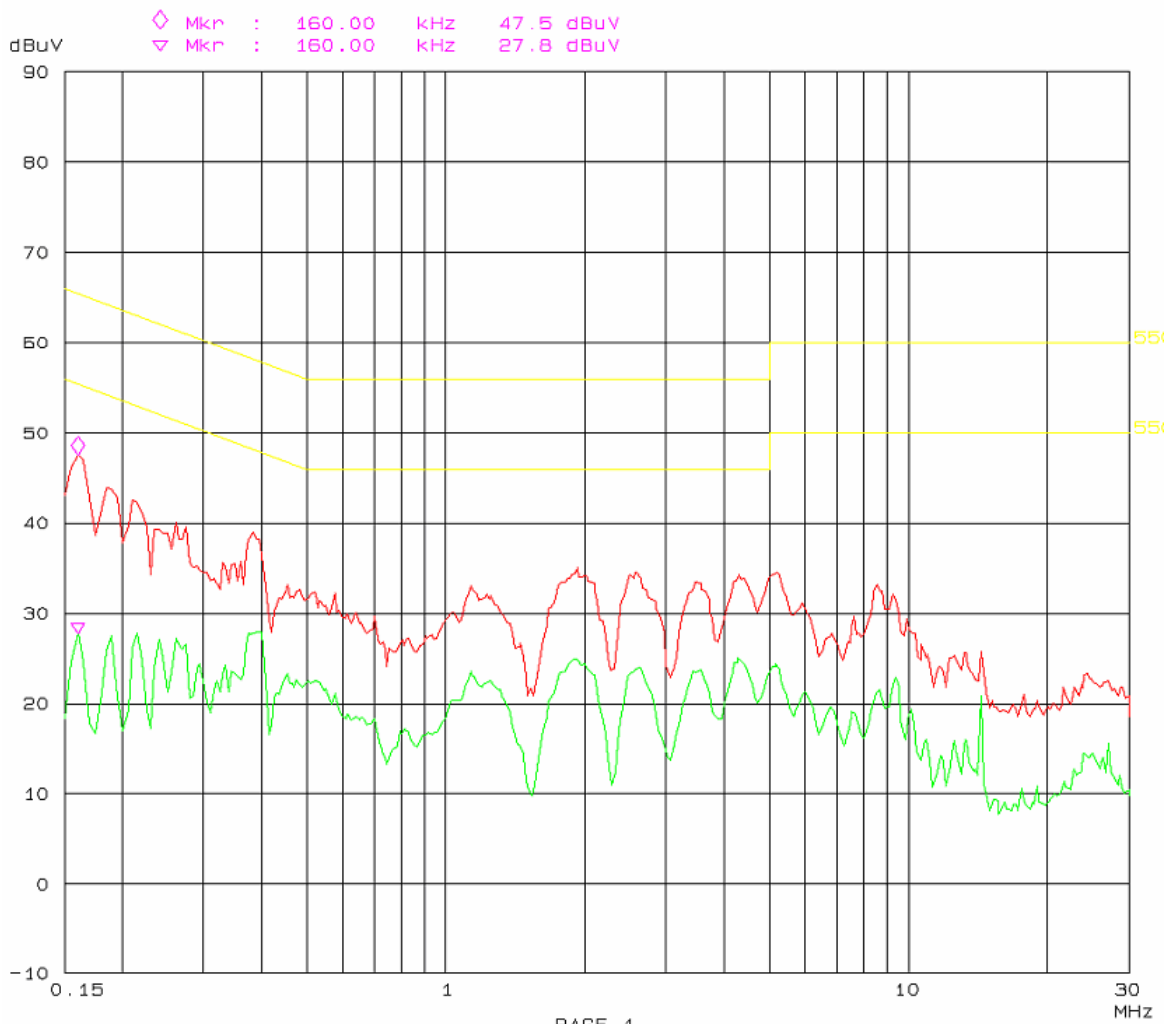
Model: SW8011
Op Cond: transmitting
Operator: Phoenix Liu
Test Spec: AC 120V/60Hz L
Comment: Temp: 25 Humi 56%



Conducted Emission Test FCC PART 15

ompo

Manuf: Swann
Op Cond: transmitting
Operator: Phoenix Liu
Test Spec: AC 120V/60Hz N
Comment: Temp: 25 Humi 56%



§15.205(a) §15.209(a) §15.249(a) §15.249(d) - RADIATED EMISSIONS

Applicable Standard

As per §15.249 (a), except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

As per §15.249 (c), Field strength limits are specified at a distance of 3 meters.

(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 §15.209, whichever is the lesser attenuation.

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is ± 4.0 dB.

Test Equipment Setup

The spectrum analyzer or receiver is set as:

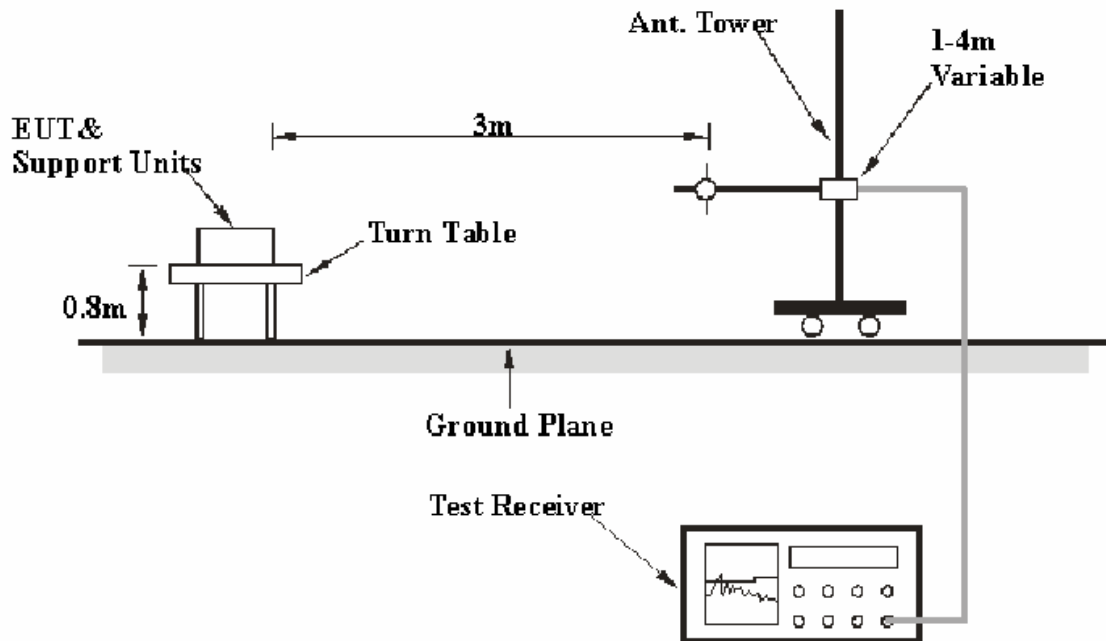
Below 1000 MHz:

$$\text{RBW} = 100 \text{ kHz} / \text{VBW} = 300 \text{ kHz} / \text{Sweep} = \text{Auto}$$

Above 1000 MHz:

- (1) Peak: RBW = 1 MHz / VBW = 1 MHz / Sweep = Auto
- (2) Average: RBW = 1 MHz / VBW = 10 Hz / Sweep = Auto

EUT Setup



The radiated emission and out of band emission tests were performed in the 3 meters chamber B, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15.209 and FCC 15.249 limits.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2007-10-16	2008-10-16
HP	Amplifier	8447E	1937A01046	2006-11-15	2007-11-15
Sunol Sciences	Bilog Antenna	JB1	A040904-2	2007-08-14	2008-08-14
HP	Amplifier	8449B	3008A00277	2007-09-29	2008-09-29
Sunol Sciences	Horn Antenna	DRH-118	A052604	2007-09-25	2008-09-25
Agilent	Spectrum Analyzer	8564E	3943A01781	2006-11-22	2007-11-22

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

For the radiated emissions test, the EUT, and all support equipment power cords was connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The EUT is set 3 meter away from the testing antenna, which is varied from 1-4 mete, and the EUT is placed on a turntable, which is 0.8 meter above ground plane, the table shall be rotated for 360 degrees to find out the highest emission. The receiving antenna should be changed the polarization both of horizontal and vertical.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.209 & 15.249, with the worst margin reading of:

30-1000 MHz:

13.2 dB at **943.607500 MHz** in the **Horizontal** polarization.

Above 1GHz:

9.55 dB at **9656 MHz** in the **Horizontal** polarization.

Test Data

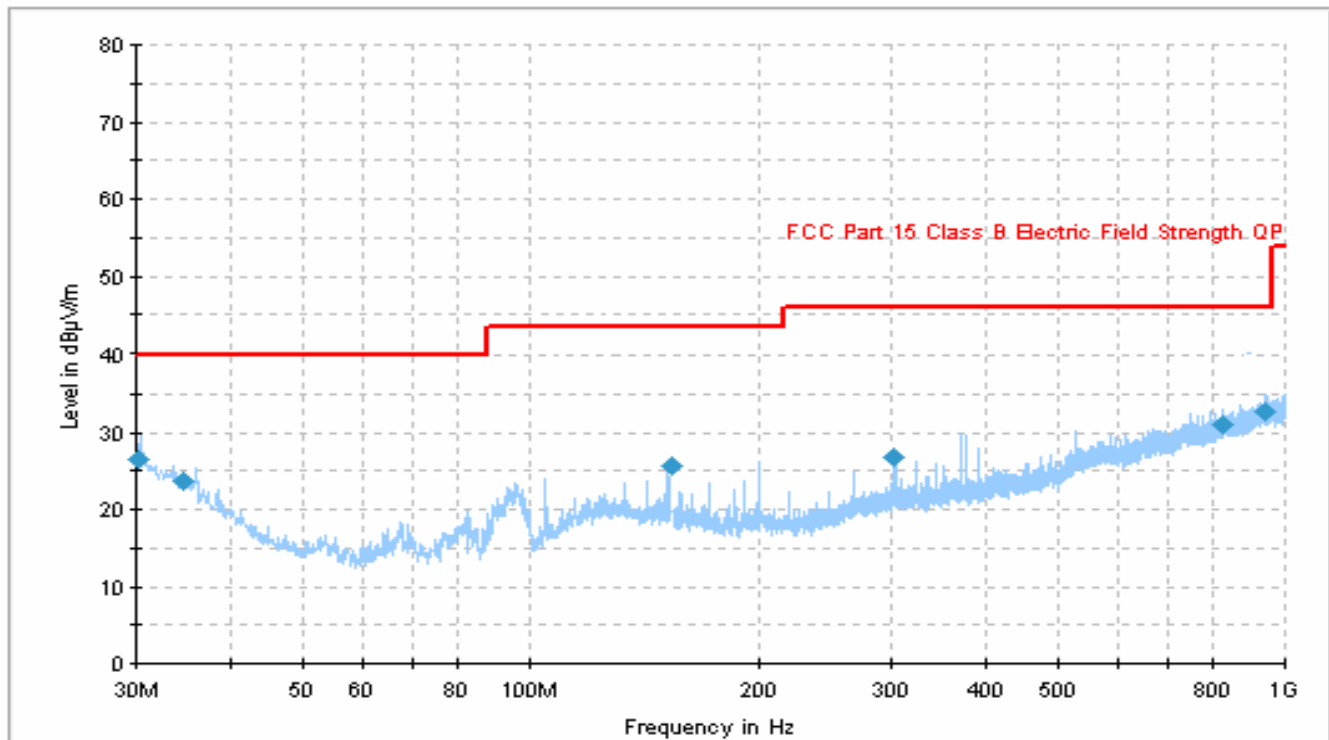
Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53 %
ATM Pressure:	100.9 kPa

The testing was performed by Phoenix Liu on 2007-10-16.

Test Mode: Transmitting

Below 1GHz:



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dBµV/m)	Margin (dB)
943.607500	32.8	237.0	H	293.0	1.2	46.0	13.2
30.135355	26.5	142.0	H	90.0	-4.4	40.0	13.5
826.937125	31.0	217.0	H	329.0	-0.5	46.0	15.0
34.643125	23.7	390.0	H	110.0	-7.6	40.0	16.3
152.735375	25.6	224.0	H	173.0	-12.3	43.5	17.9
301.235462	26.3	253.0	V	191.0	-8.4	46.0	19.7

Above 1GHz:

Freq. (MHz)	Meter Reading (dBuV)	Detector (PK/ AV)	Direction (Degree)	Ant. Height (m)	Ant. Polar (H / V)	Antenna Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Corrected Amp. (dBuV/m)	FCC Part 15.209 & 15.249		
										Limit (dBuV/m)	Margin (dB)	Comment
9656	35.60	AV	238	1.5	H	37.6	5.35	34.1	44.45	54	9.55	Harmonic
4828	41.67	AV	180	1.6	V	31.3	4.64	33.4	44.21	54	9.79	Harmonic
2414	87.67	AV	45	1.0	V	27.4	3.61	35.0	83.68	94	10.32	Fund.
9656	34.50	AV	158	1.3	V	37.6	5.35	34.1	43.35	54	10.65	Harmonic
2414	86.17	AV	263	1.4	H	27.4	3.61	35.0	82.18	94	11.82	Fund.
7242	35.67	AV	90	1.2	V	35.4	4.51	33.7	41.88	54	12.12	Harmonic
4828	35.30	AV	270	1.6	H	31.3	4.64	33.4	41.84	54	12.16	Harmonic
2414	105.04	PK	18	1.6	V	27.4	3.61	35.0	101.05	114	12.95	Fund.
7242	33.60	AV	261	1.0	H	35.4	4.51	33.7	39.81	54	14.19	Harmonic
9656	50.00	PK	158	1.3	V	37.6	5.35	34.1	58.85	74	15.15	Harmonic
9656	48.33	PK	158	1.6	H	37.6	5.35	34.1	57.18	74	16.82	Harmonic
2414	98.61	PK	20	1.2	H	27.4	3.61	35.0	94.62	114	19.38	Fund.
4828	54.06	PK	250	1.0	V	31.3	4.64	33.4	51.52	74	22.48	Harmonic
4828	46.82	PK	49	1.2	H	31.3	4.64	33.4	49.36	74	24.64	Harmonic
7242	41.33	PK	180	1.0	V	35.4	4.51	33.7	47.54	74	26.46	Harmonic
7242	40.74	PK	180	1.3	H	35.4	4.51	33.7	46.95	74	27.05	Harmonic

§15.249(d) – OUT OF BAND EMISSIONS

Applicable Standard

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 §15.209, whichever is the lesser attenuation.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set the RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including the specified frequencies of band edges.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2007-10-16	2008-10-16
HP	Amplifier	8449B	3008A00277	2007-09-29	2008-09-29
Sunol Sciences	Horn Antenna	DRH-118	A052604	2007-09-25	2008-09-25

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) Corp. attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53 %
ATM Pressure:	100.9 kPa

The testing was performed by Phoenix Liu on 2007-10-16.

Test Mode: Transmitting

Test Result: Compliant.

Please refer to the following tabular data.

Frequency (MHz)	Reading (dBuV/m)	Antenna Factor (dB/m)	Cable Loss (dB)	Pre-Amplifier (dB)	Corrected Amplitude (dBuV/m)	Limit (dBuV)	Margin (dB)
2399.9	43.10	27.4	3.61	35.0	39.11	54	14.89
2483.6	42.81	27.4	3.61	35.0	38.82	54	15.18