NVLAP LAB CODE 200707-0

FCC PART 15.235
EMI MEASUREMENT AND TEST REPORT

For

ROSTECH (HK) COMPANY

13th floor, WahKit Commercial Centre, 302 Des Voeux Road Central, HongKong

FCC ID: VH5SP900-RS20

This Report Concerns:	Equipment Type:
☒ Original Report	Transmitter, Wireless speaker system

Test Engineer:	Simon Mo simon mo
Report No.:	RSZ07071103
Test Date:	2007-07-17
Report Date:	2007-07-20
Reviewed By:	EMC Manager: Boni Baniqued
Prepared By:	Bay Area Compliance Laboratory Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The ROSTECH (HK) COMPANY's product, model number: SP900-RS20 or the "EUT" as referred to in this report is a Wireless speaker system which measures approximately 9.0cm L x 5.2cm W x 8.0cm H, rated input voltage: DC 12V adapter.

Adapter manufacturer: DONG HAO ELECTRONICS FACTORY, Model: DU120050D
Input: 120VAC 60Hz 15W, Output: 12VDC 500mA

** The test data gathered are from production sample, serial number: 0707024 provided by the manufacturer, we receive the EUT on 2007-07-11.*

Objective

This Type approval report is prepared on behalf of *ROSTECH (HK) COMPANY* in accordance with Part 2, Subpart J, and Part 15, Subparts A, B and C of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules, section 15.203, 15.205, 15.207, 15.209 and 15.235 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 Laboratory 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, 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/ts/htdocs/210/214/scopes/2007070.htm

SYSTEM TEST CONFIGURATION

Justification

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

EUT Exercise Software

N/A.

Special Accessories

The special accessories were supplied by Bay Area Compliance Laboratory Corp. (Shenzhen).

Equipment Modifications

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

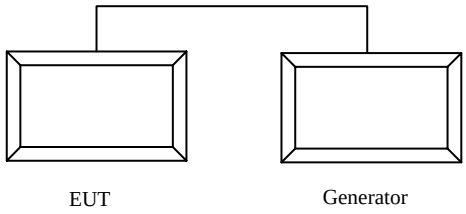
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
NANYAN	Audio Generator	NY2201	019596	DoC

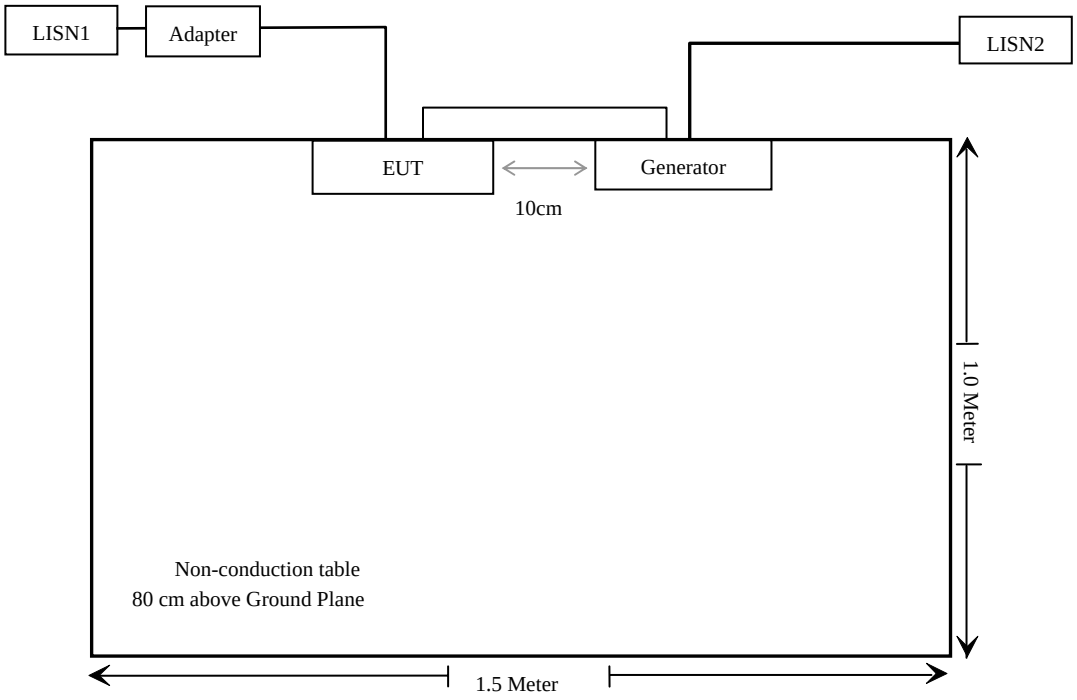
External I/O Cable

Cable Description	Length (m)	From/Port	To
Unshielded Detachable DC Cable	0.8	EUT	Adapter
Unshielded Detachable Audio Cable	0.5	EUT	Audio Generator

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)	Conducted Emissions	Compliant
§15.209(a) §15.235(a) §15.205	Radiated Emissions	Compliant
§15.235(b)	Band Edge Testing	Compliant

Note: The fundamental of the EUT was 49.86 MHz.

§15.203 - ANTENNA REQUIREMENT

Standard Applicable

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.

This product has a permanent antenna, fulfill the requirement of this section. Please refer to the EUT photos.

Test Result: Compliant.

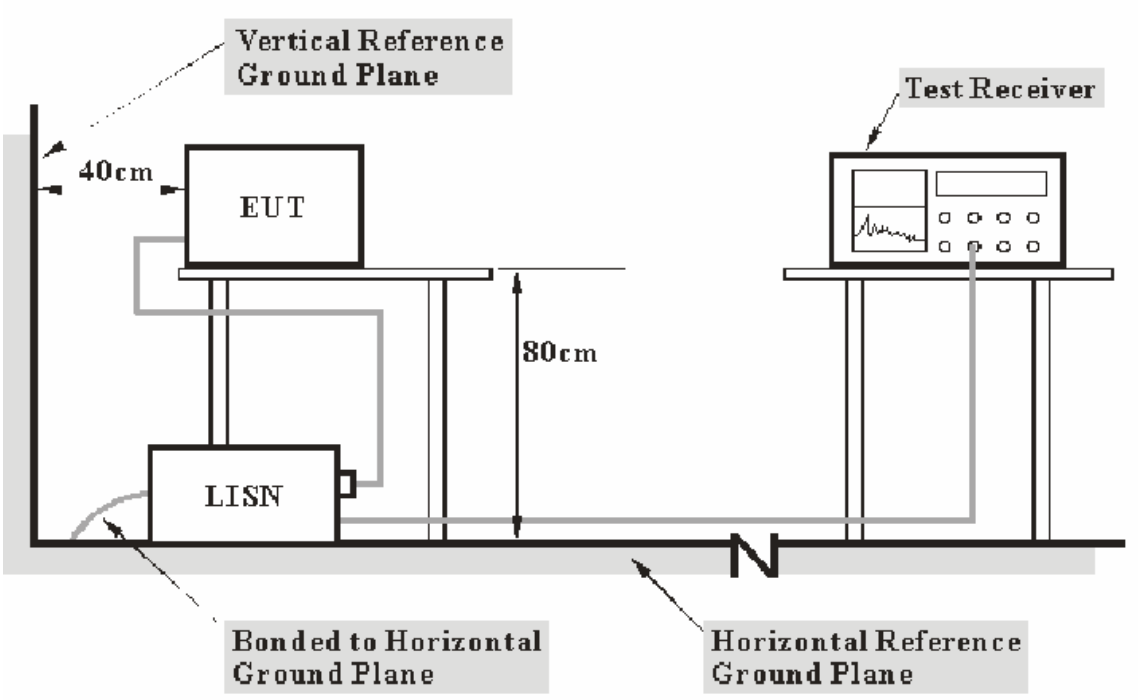
§15.207(a) - CONDUCTED EMISSIONS

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 Laboratory 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 external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

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 EMI 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:

Frequency Range	***IFBW***
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 Laboratory 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 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:

11.10 dB at **0.5800 MHz** in the **Neutral** conductor mode.

Test Data

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	56%
ATM Pressure:	100.0kPa

The testing was performed by Simon Mo on 2007-07-17.

Test Mode: Transmitting

Line Conducted Emissions				FCC PART 15.207	
Frequency (MHz)	**Amplitude (dBμV)**	**Detector (QP/AV)**	**Phase (Live/Neutral)**	**Limit (dBμV)**	**Margin (dB)**
0.5800	44.90	QP	Neutral	56.00	11.10
0.2600	42.60	QP	Live	61.43	18.83
0.1500	46.90	QP	Neutral	66.00	19.10
0.5750	36.30	QP	Live	56.00	19.70
0.1500	45.40	QP	Live	66.00	20.60
6.8350	39.20	QP	Live	60.00	20.80
0.5750	23.50	AV	Live	46.00	22.50
0.5800	21.90	AV	Neutral	46.00	24.10
0.2600	26.80	AV	Live	51.43	24.63
6.1950	33.90	QP	Neutral	60.00	26.10
5.9350	32.50	QP	Neutral	60.00	27.50
1.1300	24.10	QP	Live	56.00	31.90
27.4250	27.90	QP	Neutral	60.00	32.10
26.8900	27.20	QP	Live	60.00	32.80
1.1300	11.20	AV	Live	46.00	34.80
0.1500	21.10	AV	Live	56.00	34.90
0.1500	15.90	AV	Neutral	56.00	40.10
6.1950	8.40	AV	Neutral	50.00	41.60
27.4250	7.80	AV	Neutral	50.00	42.20
6.8350	7.80	AV	Live	50.00	42.20
26.8900	7.60	AV	Live	50.00	42.40
10.4750	17.30	QP	Neutral	60.00	42.70
5.9350	7.30	AV	Neutral	50.00	42.70
10.4750	6.60	AV	Neutral	50.00	43.40

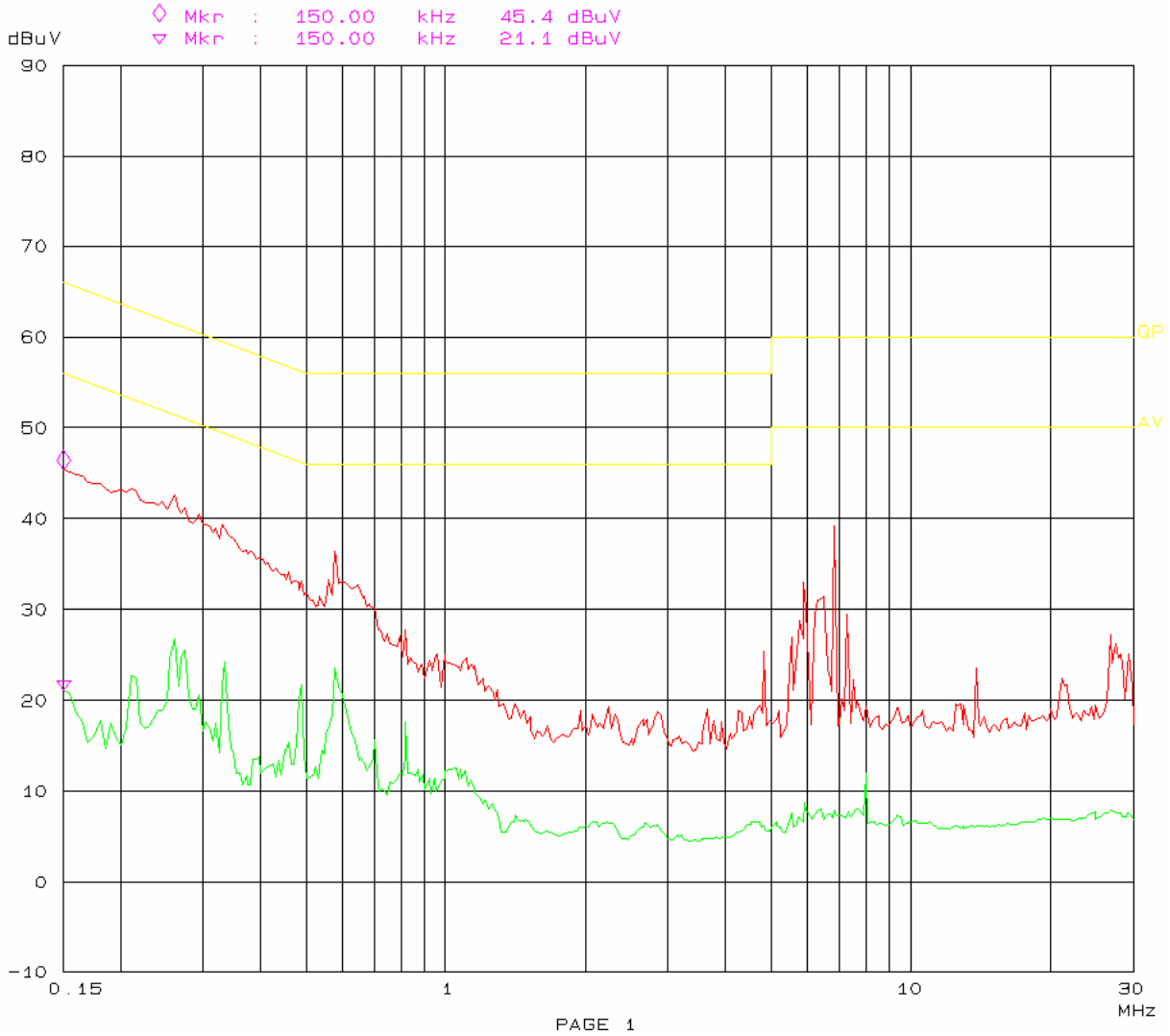
Plot(s) of Test Data

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

Conducted Emission Test
FCC Part 15C

17. Jul 07 20:22

EUT: WIRELESS SPEAKER SYSTEM M/N: SP900-RS20
Manuf: ROSTECH
Op Cond: TRANSMITTING
Operator: SIMON
Test Spec: AC120V/60HZ L
Comment: Temp: 25 Humi: 56%

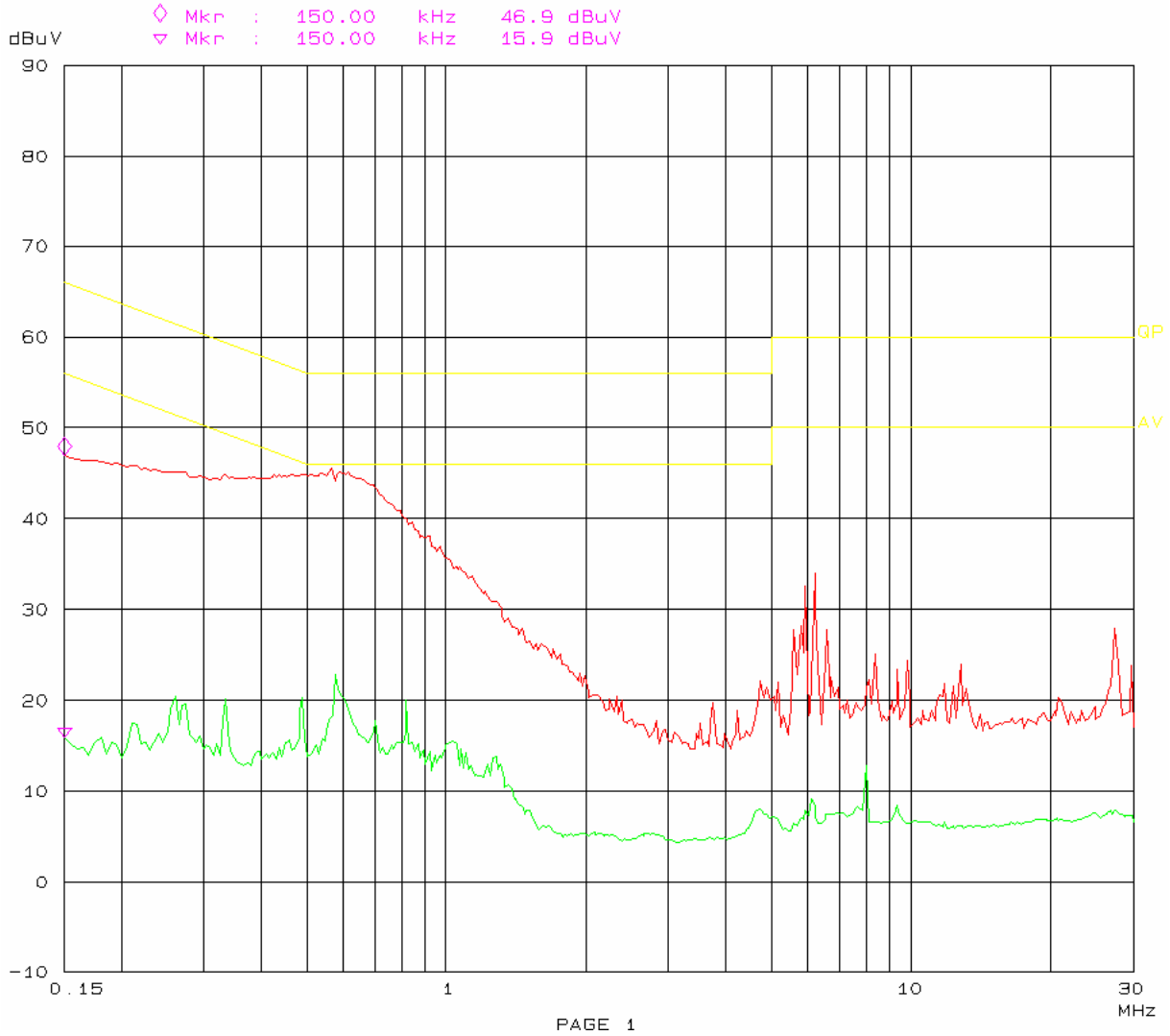


Conducted Emission Test

17. Jul 07 20:46

FCC PART 15C

EUT: WIRELESS SPEAKER SYSTEM M/N: SP900-RS20
Manuf: ROSTECH
Op Cond: TRANSMITTING
Operator: SIMON
Test Spec: AC120V/60HZ N
Comment: Temp: 25 Humi: 56%



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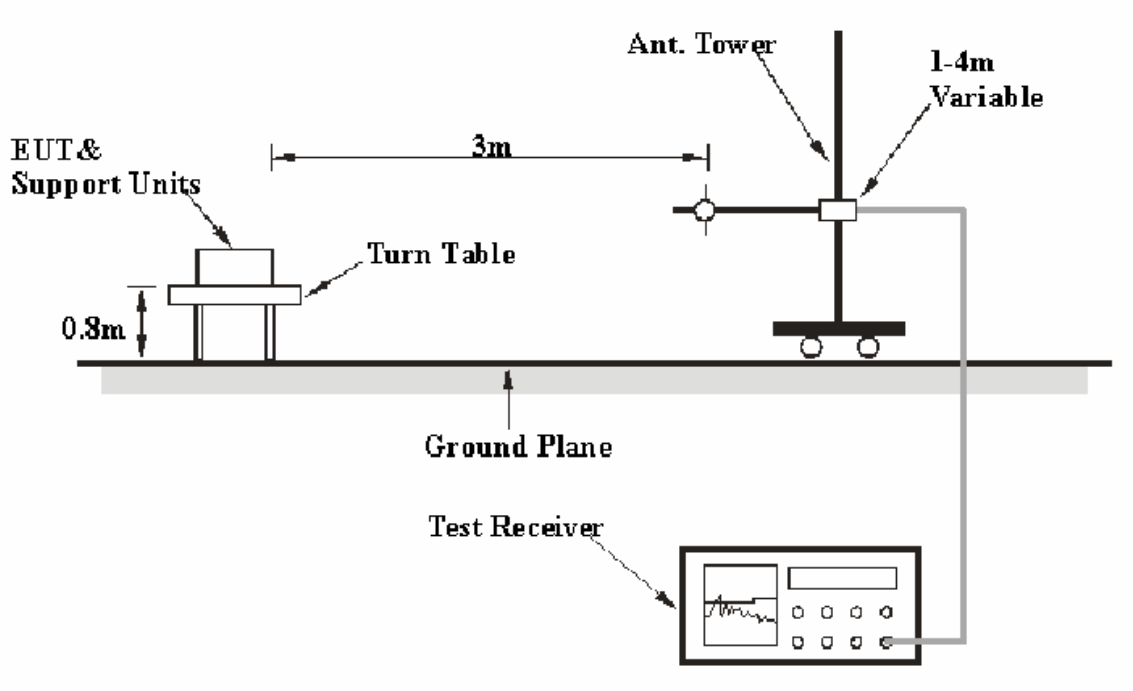
§15.209(a) §15.235(a) §15.205- RADIATED EMISSIONS

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, 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 Laboratory Corp. (Shenzhen) is ±4.0 dB.

EUT Setup



The radiated emission tests were performed in the chamber B test site, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15.209 and 15.235 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

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 system was investigated from 30 MHz to 1000 MHz.

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

Frequency Range	***R B/W***	***Video B/W***	***IF B/W***
30 – 1000 MHz	100 kHz	100 kHz	120 kHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	8447E	1937A01046	2006-11-15	2007-11-15
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2006-09-29	2007-09-29
Sunol Sciences	Bilog Antenna	JB1	A040904-2	2006-08-14	2007-08-14

*** Statement of Traceability:** Bay Area Compliance Laboratory 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 adapter was connected to the outlet of the LISN.

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

All data was recorded in the Quasi-peak, Average and Peak detection mode.

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:

Corr. Ampl. = Meter Reading + Antenna Factor + Cable Loss - 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:

Margin = Limit - Corr. Ampl.

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.209 & 15.235, with the worst margin reading of:

2.5 dB at **99.712200 MHz** in the **Horizontal** polarization.

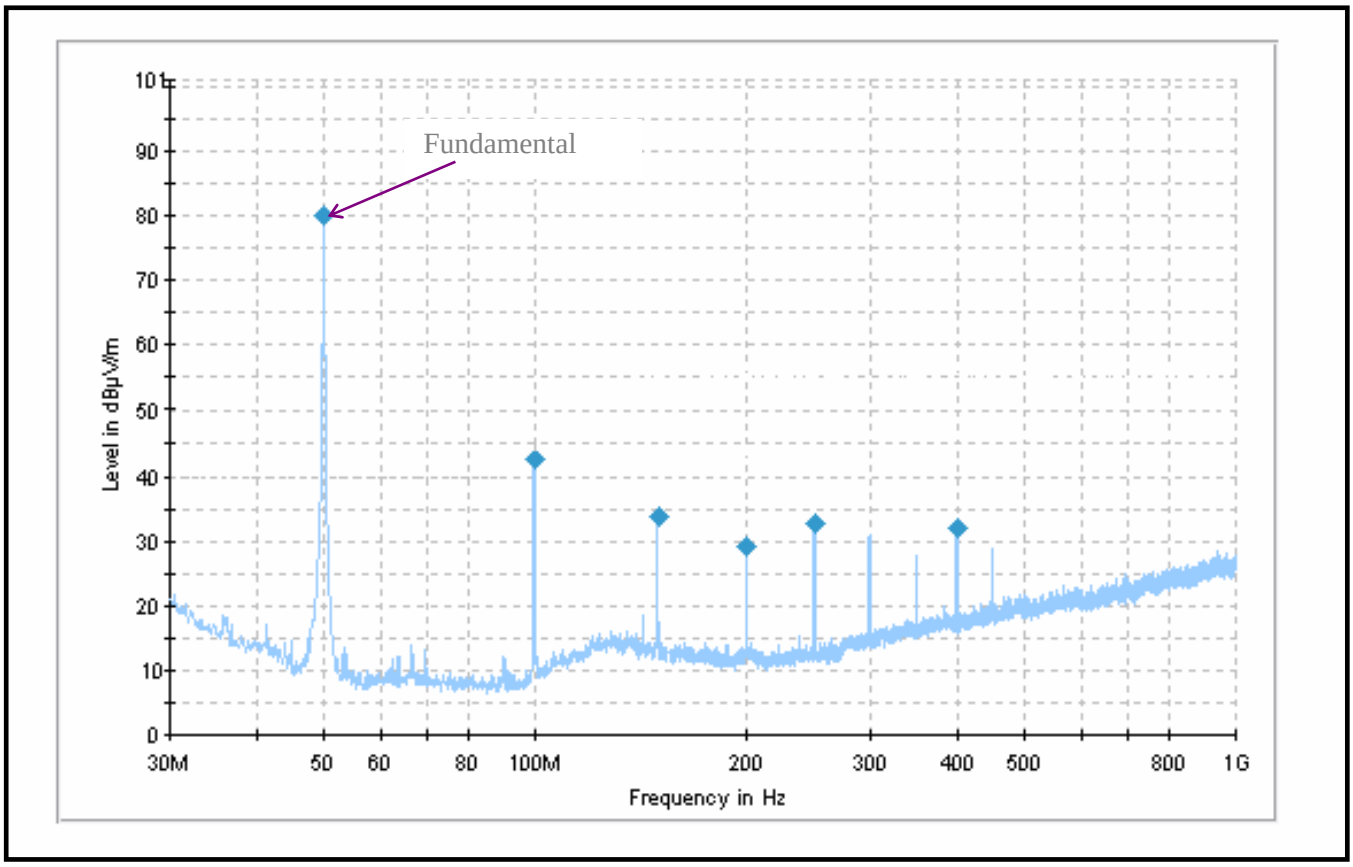
Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Simon Mo on 2007-07-17.

Test Mode: Transmitting



Frequency (MHz)	Quasi-Peak (dBµV/m)	Antenna Height (cm)	Polarity	Turntable Position (deg)	Corr. (dB)	Limit (dBµV/m)	Margin (dB)	Comment
99.712200	41.5	198.0	H	348.0	-17.4	43.5	2.5	Harmonic
149.560150	33.8	183.0	H	342.0	-13.4	43.5	9.7	Harmonic
249.291550	32.8	140.0	H	118.0	-12.9	46.0	13.2	Harmonic
399.573075	32.1	101.0	H	150.0	-8.8	46.0	13.9	Harmonic
199.384375	29.3	162.0	H	337.0	-13.0	43.5	14.2	Harmonic

Indicated		Table Angle Degree	Antenna		Correction Factor			Corr. Ampl. (dBμV/m)	FCC PART 15.209&15.235		
Frequency (MHz)	Meter Reading (dBμV)		Height (m)	Polar H/ V	Antenna Factor (dB/m)	Cable Loss (dB)	Pre-Amplifier (dB)		Limit (dBμV/m)	Margin (dB)	Comments QP/PK/AV
49.86	95.66	180	1.5	V	7.1	0.54	26.8	76.5	80	3.5	Fund. (AV)
49.86	91.76	90	1.2	H	7.1	0.54	26.8	72.6	80	7.4	Fund. (AV)
49.86	98.96	180	1.5	V	7.1	0.54	26.8	79.8	100	20.2	Fund. (PK)
49.86	91.96	90	1.2	H	7.1	0.54	26.8	72.8	100	27.2	Fund. (PK)

§15.235(b) - BAND EDGES TESTING

Standard Applicable

The field strength of any emissions appearing between the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 26 dB below the level of the unmodulated carrier or to the general limits in §15.209, whichever permits the higher emission levels. The field strength of any emissions removed by more than 10 kHz from the band edges shall not exceed the general radiated emission limits in §15.209. All signals exceeding 20 microvolts/meter at 3 meters shall be reported in the application for certification.

Test Procedure

With the EUT's antenna attached, the EUT's radiated emission power was received by the test antenna which was connected to the test receiver setup with the START and STOP frequencies set to the EUT's operation band.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2006-09-29	2007-09-29

*** Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) 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:	56 %
ATM Pressure:	101.0kPa

The testing was performed by Simon Mo on 2007-07-17.

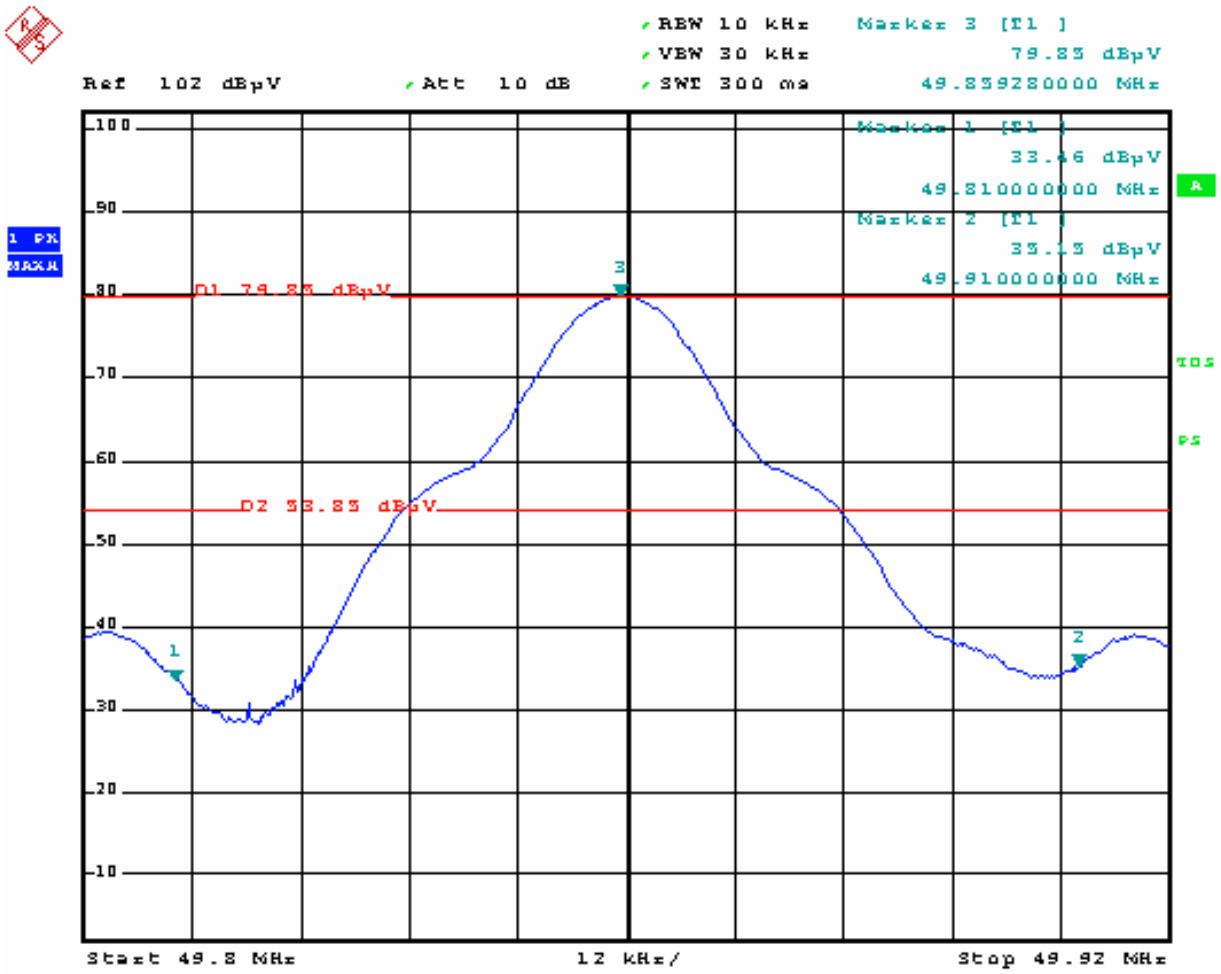
Test Mode: Transmitting

Frequency (MHz)	Emission Level （dBuV/m）	Attenuation （dB）	Limit (dB）	Margin （dB）
49.81	33.46	46.39	26	20.39
49.91	35.15	44.70	26	18.70

NOTE: *ATTENUATION=PEAK POWER-EMISSION LEVEL*
Margin= ATTENUATION-LIMIT

Result: Compliant. Please refer to the plot attached.

Plot of Band Edge



BANDEDGE(M/N:SP900-RS20)

Date: 17.JUL.2007 18:56:52

END OF REPORT