



NVLAP LAB CODE 200707-0



FCC PART 15.235 EMI MEASUREMENT AND TEST REPORT

For

SHENZHEN LISAIER TRONICS CO., LTD

NO.22, Xihu Industrial Park, Xikeng, Henggang Town, Longgang District, Shenzhen, China.

FCC ID: UWOHLP900T

| | |
|--|--|
| This Report Concerns: <input checked="" type="checkbox"/> Original Report | Equipment Type: Transmitter, WIRELESS HEADPHONE TRANSMITTER |
| Test Engineer: Deny Xiong <i>Deny Xiong</i> | |
| Report No.: RSZ06121803 | |
| Test Date: 2006-12-26 | |
| Report Date: 2007-01-04 | |
| Reviewed By: EMC Manager: Boni Baniqued <i>Boni</i> | |
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The SHENZHEN LISAIER TRONICS CO., LTD 's product, model number: *HP-WH900* or the "EUT" as referred to in this report is a *WIRELESS HEADPHONE TRANSMITTER*. The EUT is measured approximately 7.7 cm L x 3.8 cm W x 10.6 cm H, rated input voltage: DC 12 V.

AC-DC ADAPTOR: CLASS 2 POWER SUPPLY

Model: YU120020D1; Input: AC 120VAC 60Hz 12W; Output: 12V DC 200mA.

** The test data gathered are from production sample, serial number: 0612020, provided by the manufacturer, we receive the EUT on 2006-12-18.*

Objective

This Type approval report is prepared on behalf of *SHENZHEN LISAIER TRONICS CO., LTD* 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). The current scope of accreditations can be found at <http://ts.nist.gov/ts/htdocs/210/214/scopes/2007070.htm>

Local Support Equipment List and Details

| Manufacturer | Description | Model | Serial Number | FCC ID |
|--------------|-----------------|--------|---------------|--------|
| NANYAN | Audio Generator | NY-201 | N/A | DoC |

External I/O Cable

| Cable Description | Length (M) | From/Port | To |
|-------------------|------------|-----------|-----------------|
| Audio Cable | 1 | EUT | Audio Generator |

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.

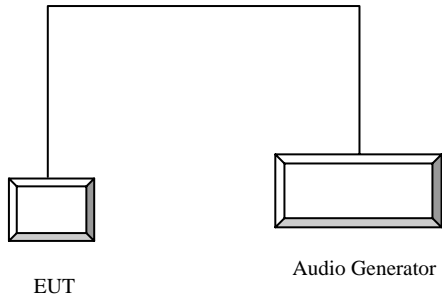
Special Accessories

N/A.

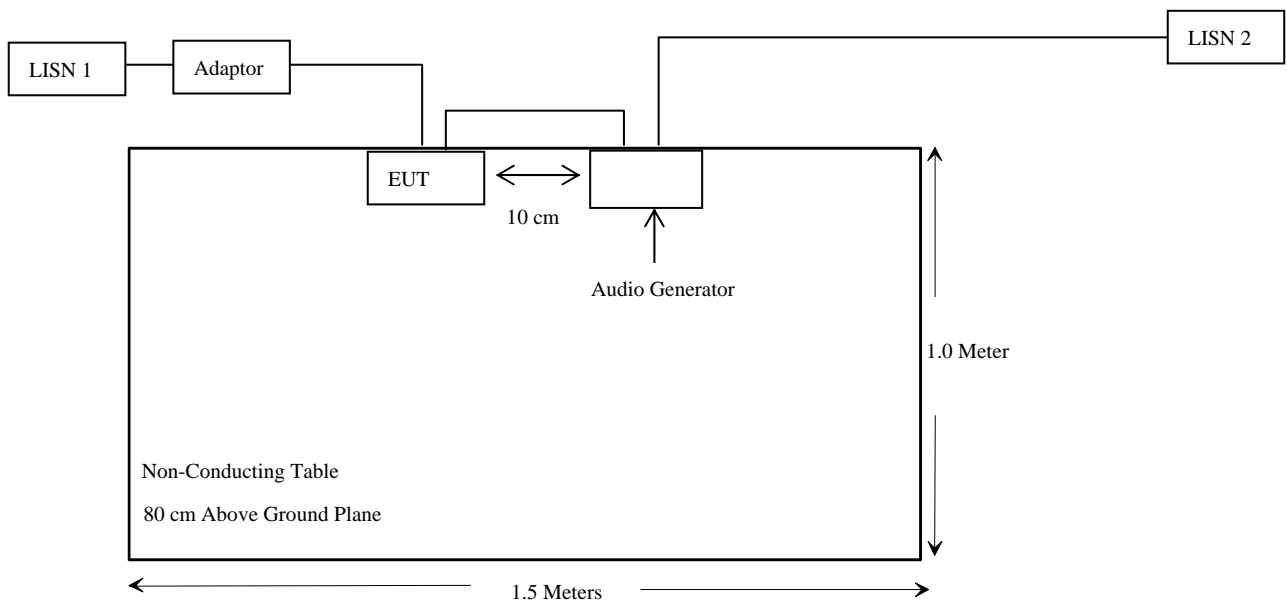
Equipment Modifications

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

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 Emission | Compliant |
| §15.209(a) §15.235(a) §15.205 | Radiated Emission | Compliant |
| §15.235(b) | Band Edge Testing | Compliant |

Note: The highest clocks of the EUT was 49.85 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, and please refer to the EUT external photo.

Result: Compliance.

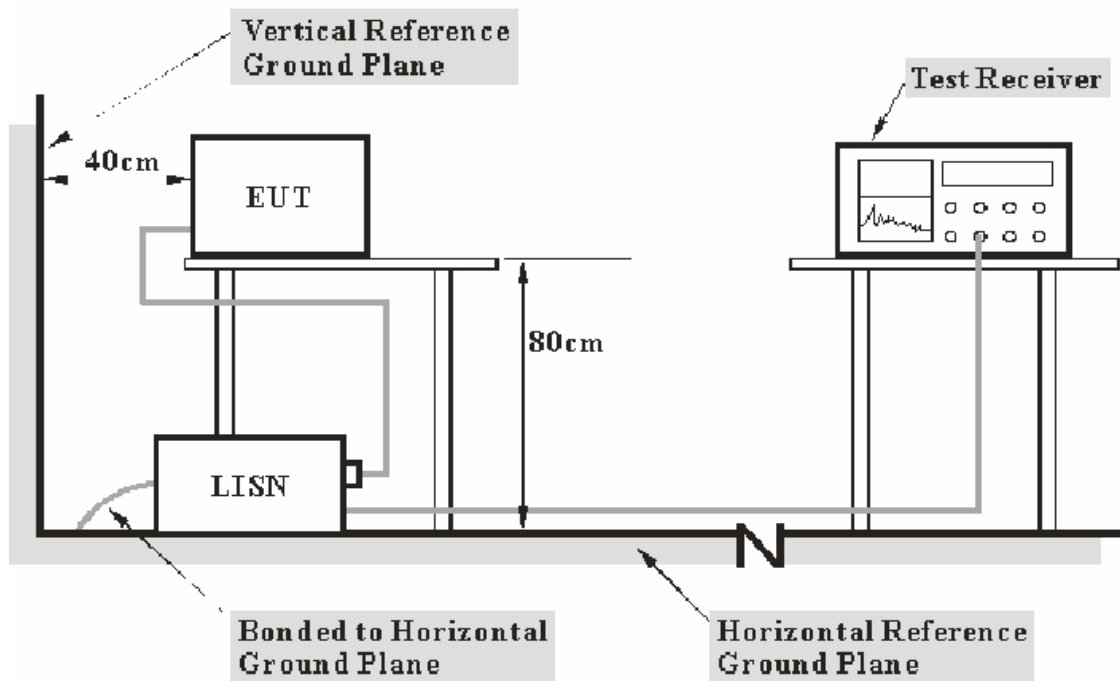
§15.207(a) - CONDUCTED EMISSION

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 adaptor 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:

| <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 |
|-----------------|-------------------|---------|---------------|------------------|----------------------|
| Rohde & Schwarz | EMI Test Receiver | ESCS30 | DE25330 | 2006-03-20 | 2007-03-19 |
| Rohde & Schwarz | L.I.S.N. | ESH2-Z5 | 892107/021 | 2006-03-01 | 2007-03-01 |

* 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 adaptor was connected to the outlet of the first LISN, and audio generator power cord 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:

23.6 dB at 0.45 MHz in the Neutral conductor mode.

Test Data**Environmental Conditions**

| | |
|--------------------|----------|
| Temperature: | 26 ° C |
| Relative Humidity: | 56% |
| ATM Pressure: | 1000mbar |

The testing was performed by Deny Xiong on 2006-12-27.

Test Mode: Transmitting

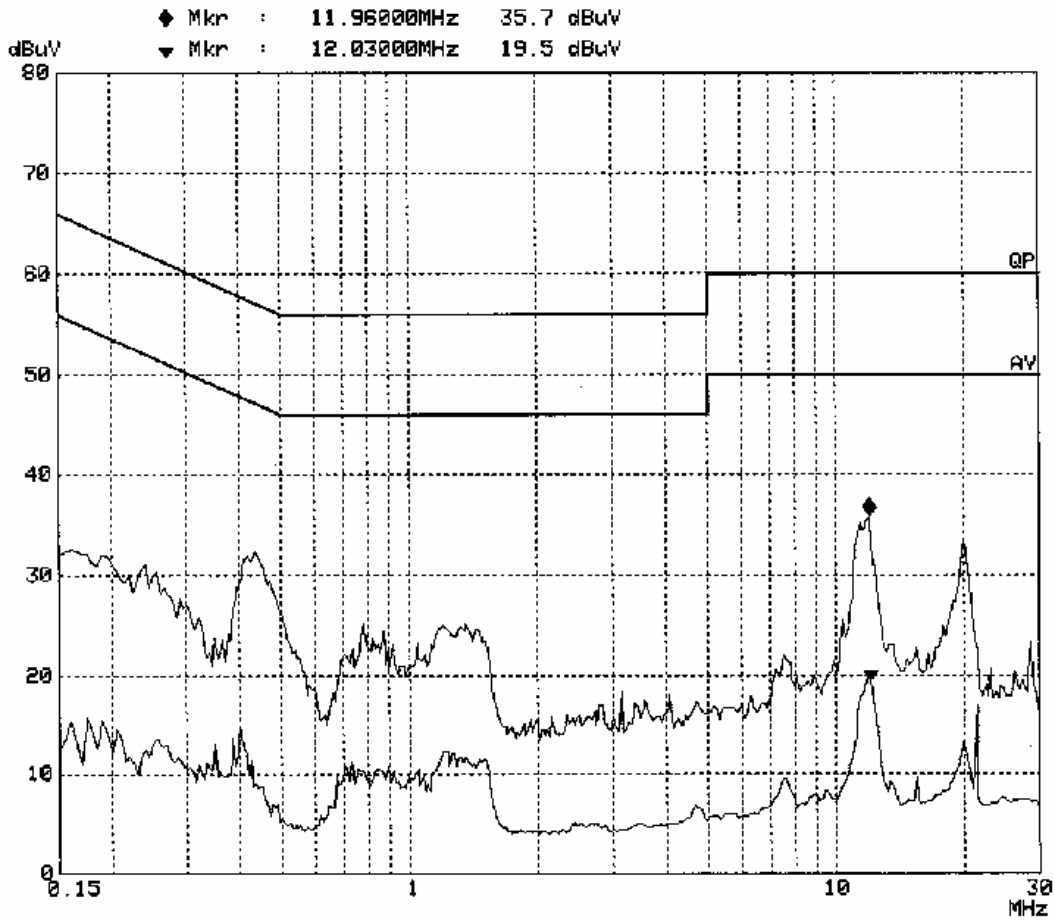
| LINE CONDUCTED EMISSIONS | | | | FCC PART 15.207 | |
|--------------------------|------------------|------------------|--------------------|-----------------|-------------|
| Frequency (MHz) | Amplitude (dBμV) | Detector (QP/AV) | Phase Live/Neutral | Limit (dBμV) | Margin (dB) |
| 0.45 | 34.2 | QP | Neutral | 57.8 | 23.6 |
| 11.96 | 35.7 | QP | Live | 60.0 | 24.3 |
| 0.435 | 32.4 | QP | Live | 57.2 | 24.8 |
| 11.665 | 35.1 | QP | Neutral | 60.0 | 24.9 |
| 20.015 | 34.9 | QP | Neutral | 60.0 | 25.1 |
| 19.885 | 33.6 | QP | Live | 60.0 | 26.4 |
| 11.665 | 23.5 | AV | Neutral | 50.0 | 26.5 |
| 0.715 | 28.8 | QP | Neutral | 56.0 | 27.2 |
| 1.16 | 26.0 | QP | Neutral | 56.0 | 30.0 |
| 12.03 | 19.5 | AV | Live | 50.0 | 30.5 |
| 0.78 | 25.3 | QP | Live | 56.0 | 30.7 |
| 1.355 | 25.2 | QP | Live | 56.0 | 30.8 |
| 0.16 | 34.5 | QP | Neutral | 65.5 | 31.0 |
| 19.885 | 13.2 | AV | Live | 50.0 | 31.0 |
| 0.715 | 14.7 | AV | Neutral | 46.0 | 31.3 |
| 0.175 | 32.1 | QP | Live | 64.7 | 32.6 |
| 1.355 | 11.6 | AV | Live | 46.0 | 34.4 |
| 1.16 | 11.3 | AV | Neutral | 46.0 | 34.7 |
| 0.78 | 10.4 | AV | Live | 46.0 | 35.6 |
| 20.015 | 12.5 | AV | Neutral | 50.0 | 37.5 |
| 0.45 | 10.2 | AV | Neutral | 47.8 | 37.6 |
| 0.435 | 9.0 | AV | Live | 47.2 | 38.2 |
| 0.16 | 17.0 | AV | Neutral | 55.5 | 38.5 |
| 0.175 | 15.8 | AV | Live | 54.7 | 38.9 |

Plot(s) of Test Data

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

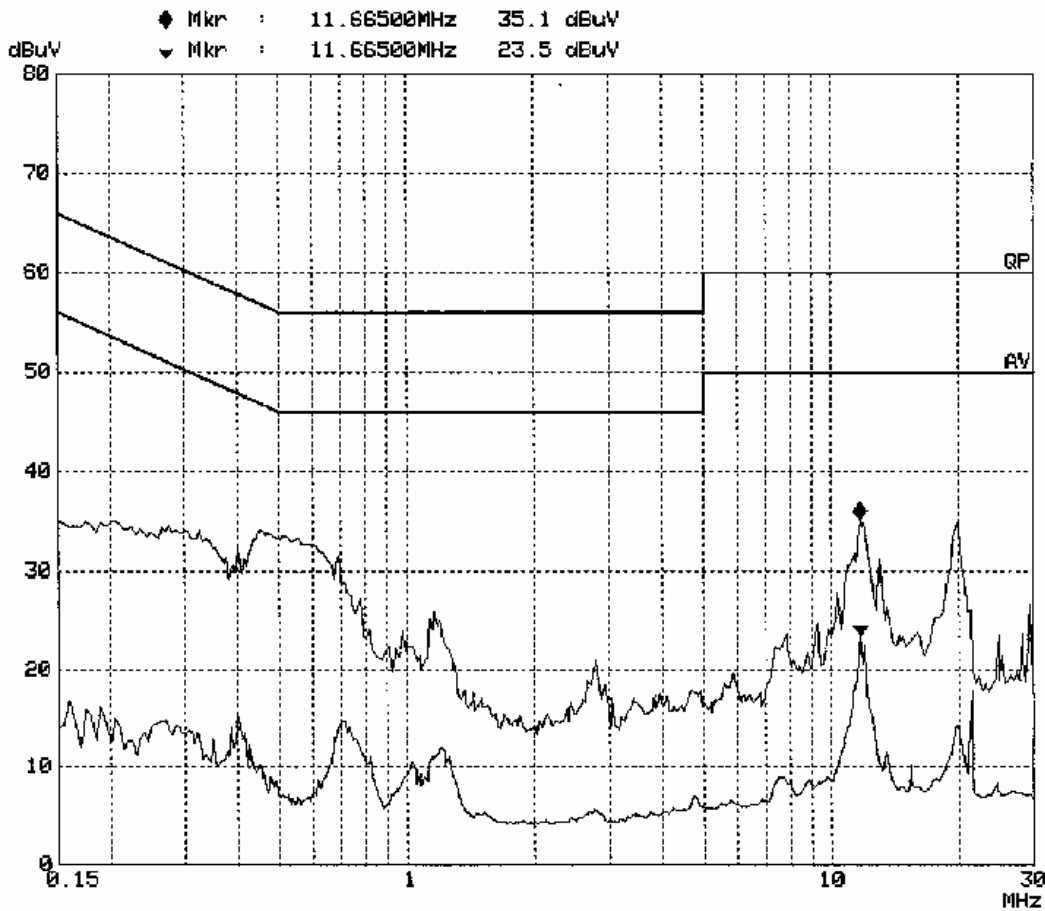
Conducted Emission Test FCC Part 15C

EUT: Wireless Headphone Transmitter
Manuf: LISAIER
Op Cond: Transmitting
Operator: deny
Test Spec: AC 120V/60Hz L
Comment: Temp:25°C Humi:56%
M/N:HP-WH900
Date: 26. Dec 06 15:52



Conducted Emission Test FCC Part 15C

EUT: Wireless Headphone Transmitter
Manuf: LISAIER
Op Cond: Transmitting
Operator: deny
Test Spec: AC 120V/60Hz N
Comment: Temp:25'C Humi:56%
M/N:HP-WH900
Date: 26. Dec 06 16:11



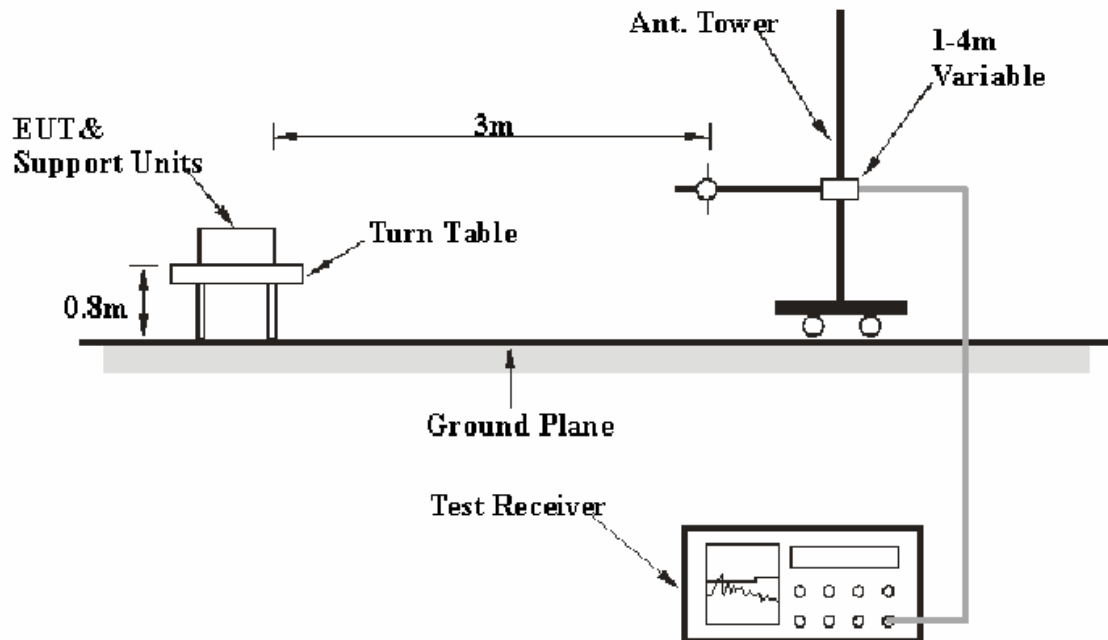
§15.209(a) §15.235(a) §15.205- RADIATED EMISSION

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 adaptor 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:

| <i>Frequency Range</i> | <i>R B/W</i> | <i>Video B/W</i> | <i>IF B/W</i> |
|------------------------|--------------|------------------|---------------|
| 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 | HP8447D | 2944A09795 | 2006-09-29 | 2007-09-29 |
| Rohde & Schwarz | EMI Test Receiver | ESCI | 100035 | 2006-09-29 | 2007-09-29 |
| Sunol Sciences | Broadband Antenna | JB1 | A040904-1 | 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 adaptor and all support equipment power cords were connected to the AC floor outlet.

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 Loss and Cable Loss, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Meter Reading} + \text{Antenna Loss} + \text{Cable Loss} - \text{Amplifier Gain}$$

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:

$$\text{Margin} = \text{Limit} - \text{Corr. Ampl.}$$

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:

16.90 dB at 49.85 MHz in the Vertical polarization.

Test Data**Environmental Conditions**

| | |
|--------------------|----------|
| Temperature: | 25°C |
| Relative Humidity: | 50 % |
| ATM Pressure: | 1010mbar |

The testing was performed by Deny Xiong on 2006-12-26.

Test Mode: Transmitting

| Indicated | | Table | Antenna | | Correction Factor | | | Corrected Amplitude | FCC PART 15.209&15.235 | | |
|-----------------|----------------------------|--------------|--------------|------------|-----------------------|-----------------|---------------------|----------------------------|------------------------|-------------|------------------|
| Frequency (MHz) | Meter Reading dB μ V/m | Angle Degree | Height Meter | Polar H/ V | Antenna Factor (dB/m) | Cable Loss (dB) | Amplifier Gain (dB) | Corr. Ampl. (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Note |
| | | | | | | | | | | | QP/PK/AV |
| 49.85 | 82.26 | 153 | 1.5 | V | 7.1 | 0.54 | 26.8 | 63.10 | 80.0 | 16.90 | Fundamental (AV) |
| 827.49 | 25.88 | 148 | 1.2 | H | 22.2 | 5.9 | 26.7 | 27.28 | 46.0 | 18.72 | Harmonic (QP) |
| 149.55 | 38.86 | 120 | 1.5 | V | 10.7 | 1.62 | 26.6 | 24.58 | 43.5 | 18.92 | Harmonic (QP) |
| 149.55 | 37.24 | 103 | 1.5 | H | 10.7 | 1.62 | 26.6 | 22.96 | 43.5 | 20.54 | Harmonic (QP) |
| 168.40 | 34.13 | 268 | 1.3 | V | 10.2 | 1.55 | 26.6 | 19.28 | 43.5 | 24.22 | Harmonic (QP) |
| 99.70 | 34.74 | 126 | 1.6 | V | 8.4 | 0.9 | 26.6 | 17.44 | 43.5 | 26.06 | Harmonic (QP) |
| 199.40 | 28.33 | 56 | 1.3 | H | 11.6 | 1.86 | 26.0 | 15.79 | 43.5 | 27.71 | Harmonic (QP) |
| 49.85 | 90.01 | 153 | 1.5 | V | 7.1 | 0.54 | 26.8 | 70.85 | 100.0 | 29.15 | Fundamental (PK) |
| 49.85 | 63.74 | 246 | 1.2 | H | 7.1 | 0.54 | 26.8 | 44.58 | 80.0 | 35.42 | Fundamental (AV) |
| 49.85 | 69.79 | 246 | 1.2 | H | 7.1 | 0.54 | 26.8 | 50.63 | 100.0 | 49.37 | Fundamental (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 micro volts/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 | 100035 | 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: | 20 °C |
| Relative Humidity: | 55% |
| ATM Pressure: | 1016mbar |

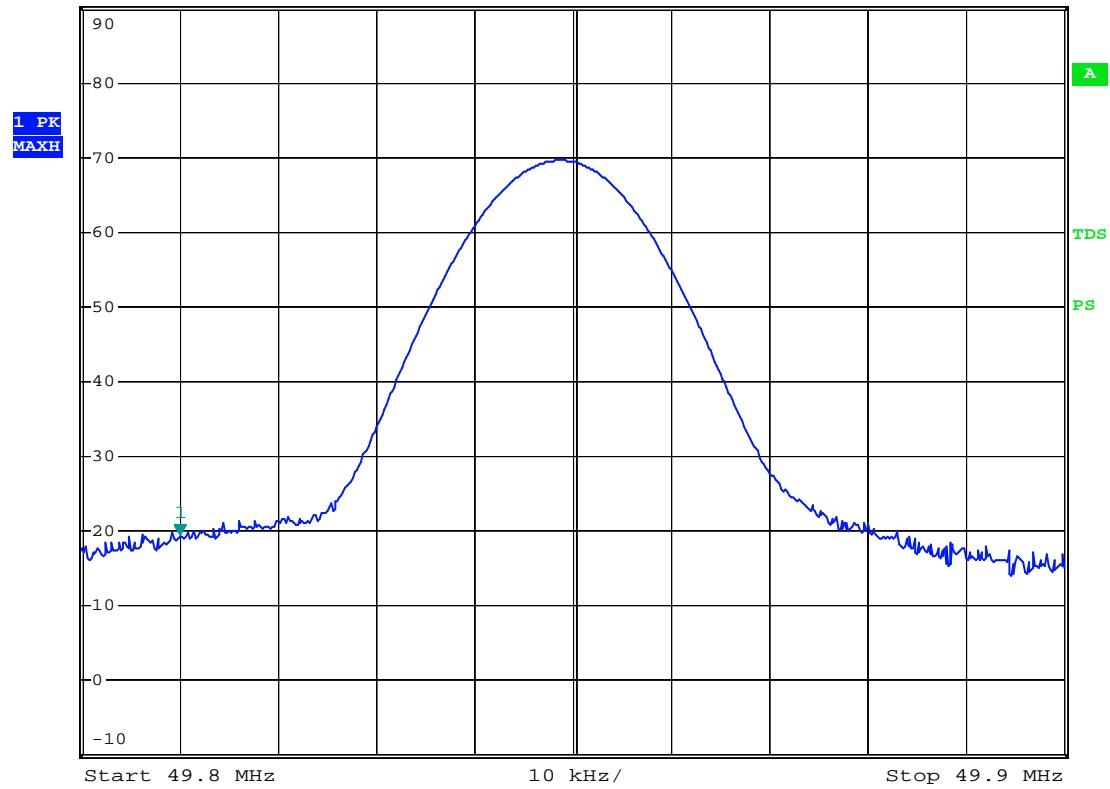
The testing was performed by Deny Xiong on 2006-12-26.

The result has been complied with the 15.235(b), see the following plot:

| Frequency (MHz) | Emission (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) |
|-----------------|-------------------------|----------------------|-------------|
| 49.81 | 19.43 | 40 | 20.57 |
| 49.91 | 14.03 | 40 | 25.97 |



*RBW 10 kHz Marker 1 [T1]
VBW 30 kHz 19.43 dBuV
*Att 10 dB *SWT 300 ms 49.81000000 MHz
Ref 90 dBuV

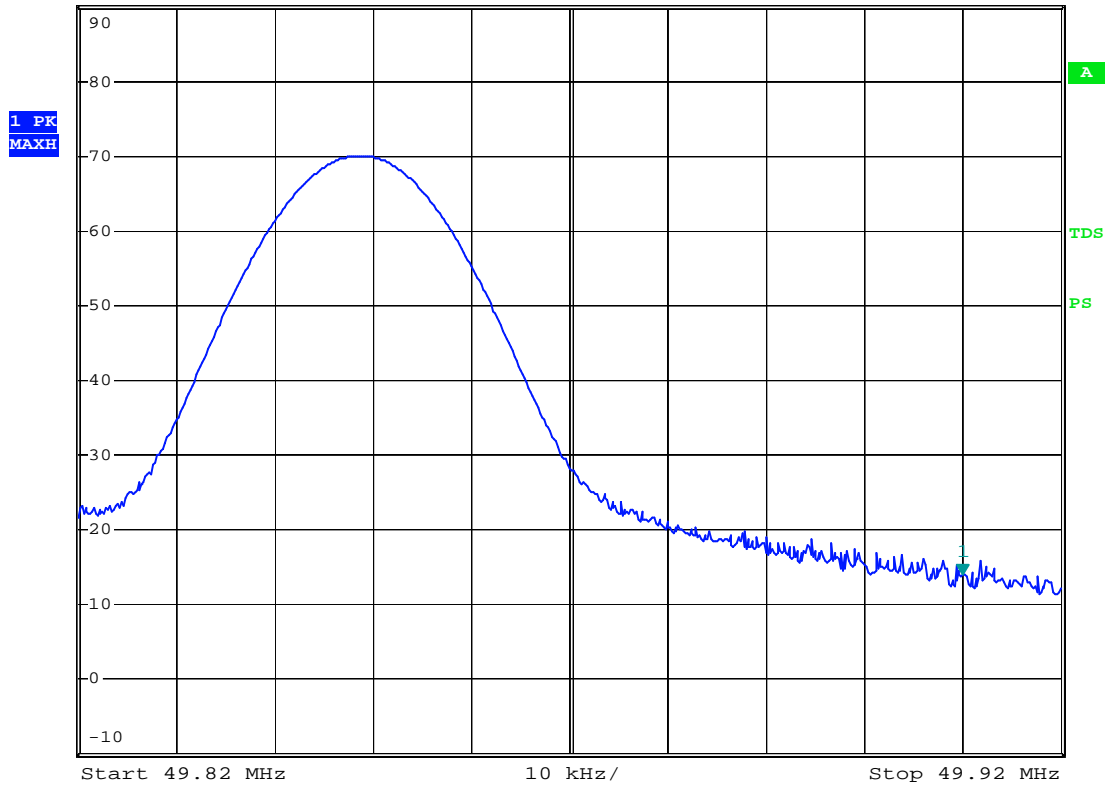


M/N:HP-WH900 bandedge1

Date: 26.DEC.2006 10:07:31



*RBW 10 kHz Marker 1 [T1]
 VBW 30 kHz 14.03 dBμV
 *Att 10 dB *SWT 300 ms 49.91000000 MHz
 Ref 90 dBμV



M/N:HP-WH900 bandedge2

Date: 26.DEC.2006 10:10:18