



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: UWOHLP2950T

This Report Concerns: <input checked="" type="checkbox"/> Original Report	Equipment Type: Transmitter, wireless Headphone
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Report No.: RSZ06121801	
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-WH2950* or the "EUT" as referred to in this report is a *WIRELESS HEADPHONE*. The EUT is measured approximately 12.5 cm L x 4.0 cm W x 9.2 cm H, rated input voltage: DC 12 V.

AC-DC ADAPTOR: CLASS 2 POWER SUPPLY

Model: TL12200D-08; Input: AC 120V 60Hz; Output: DC 12V 200mA.

** The test data gathered are from production sample, serial number: 0612018, provided by the manufacturer.*

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.

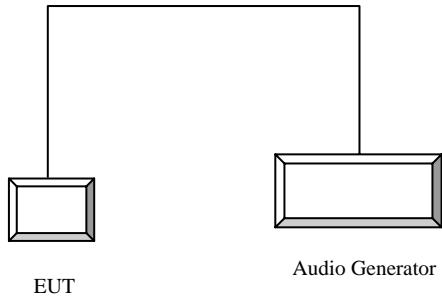
Special Accessories

N/A.

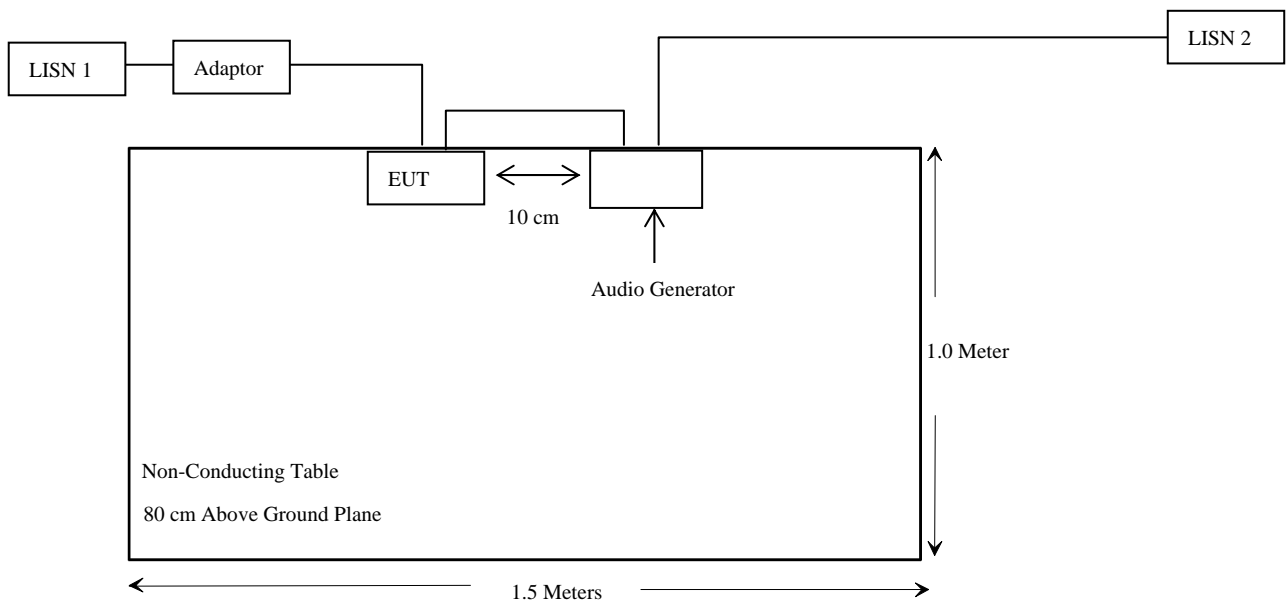
Equipment Modifications

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 external photo.

Result: Compliance.

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 were 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:

21.3 dB at 0.300 MHz in the **Live** 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

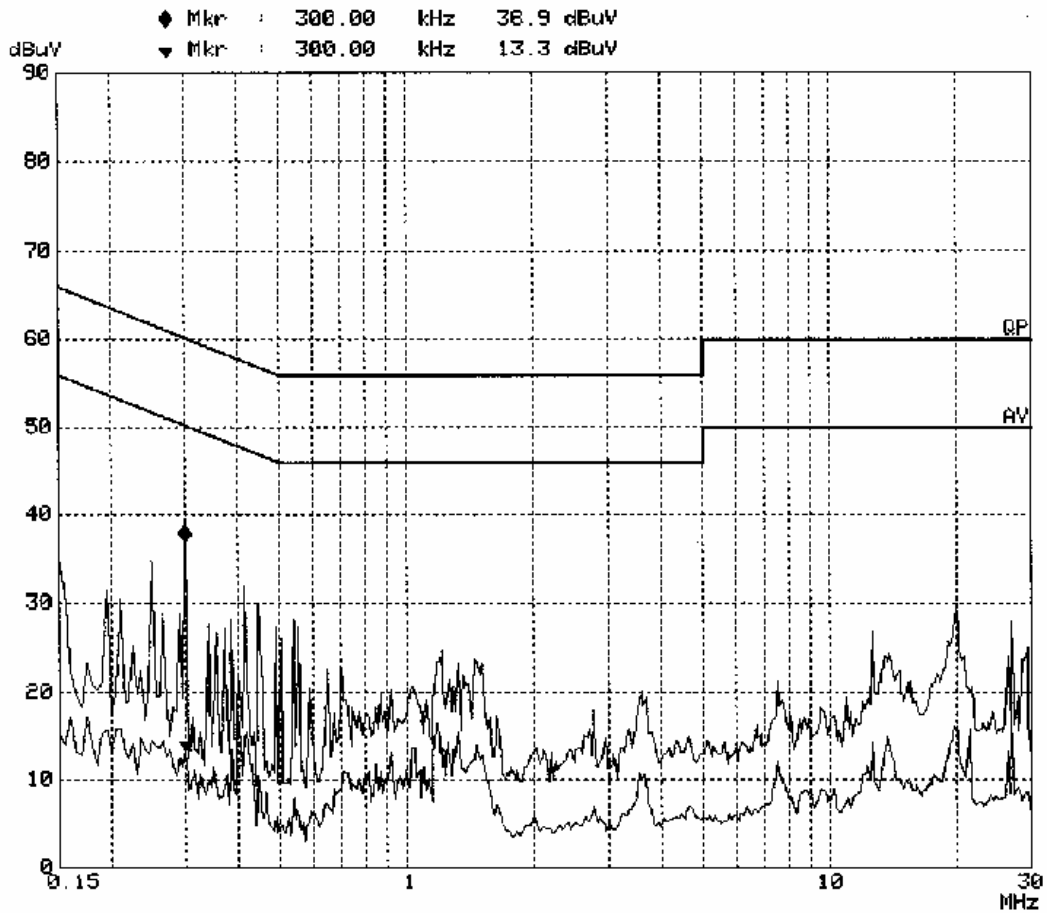
LINE CONDUCTED EMISSIONS				FCC PART 15.207	
Frequency MHz	Amplitude dBμV	Detector QP/AV	Phase Live/Neutral	Limit dBμV	Margin dB
0.300	38.9	QP	Live	60.2	21.3
29.000	35.6	QP	Neutral	60.0	24.4
0.415	32.1	QP	Live	57.5	25.4
0.250	35.0	QP	Live	61.8	26.8
0.290	33.1	QP	Neutral	60.5	27.4
0.370	30.9	QP	Neutral	58.5	27.6
0.540	28.4	QP	Live	56.0	27.6
29.000	21.2	AV	Neutral	50.0	28.8
0.400	28.9	QP	Neutral	57.9	29.0
0.730	26.0	QP	Neutral	56.0	30.0
19.870	29.4	QP	Live	60.0	30.6
0.730	15.1	AV	Neutral	46.0	30.9
0.400	16.9	AV	Neutral	47.9	31.0
1.150	15.0	AV	Neutral	46.0	31.0
1.210	24.9	QP	Live	56.0	31.1
0.415	15.0	AV	Live	47.5	32.5
1.150	23.3	QP	Neutral	56.0	32.7
19.870	15.7	AV	Live	50.0	34.3
1.210	11.4	AV	Live	46.0	34.6
0.300	13.3	AV	Live	50.2	36.9
0.370	11.2	AV	Neutral	48.5	37.3
0.250	14.5	AV	Live	51.8	37.3
0.540	7.8	AV	Live	46.0	38.2
0.290	12.2	AV	Neutral	50.5	38.3

Plot(s) of Test Data

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

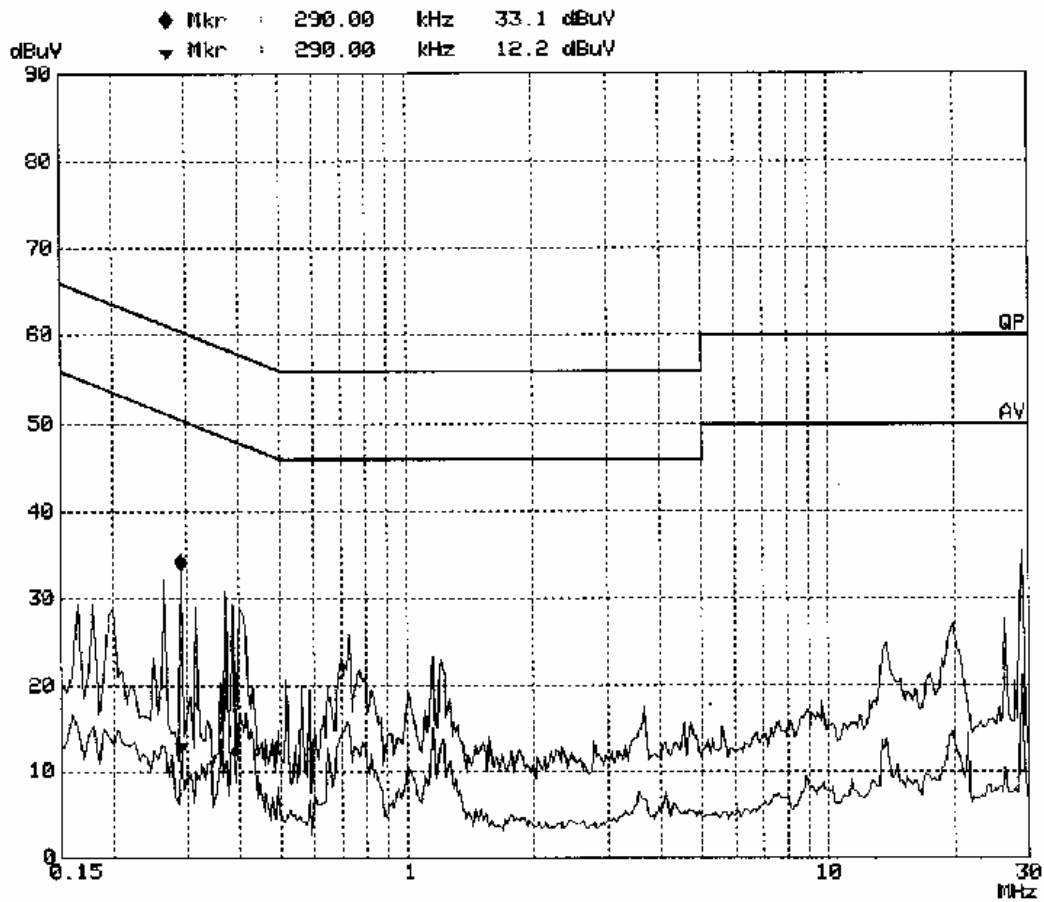
Conducted Emission Test FCC Part 15

EUT: WIRELESS HEADPHONE M/N:HP-WH2950
Manuf: LISAIER
Op Cond: Transmitting
Operator: deny
Test Spec: AC 120V/60Hz L
Comment: Temp:25°C Humi:56%
Date: 27. Dec 06 08:29



Conducted Emission Test FCC Part 15

EUT: WIRELESS HEADPHONE M/N:HP-WH2950
Manuf: LISAIER
Op Cond: Transmitting
Operator: deny
Test Spec: AC 120V/60Hz N
Comment: Temp:25'C Humi:56%
Date: 27. Dec 06 08:19



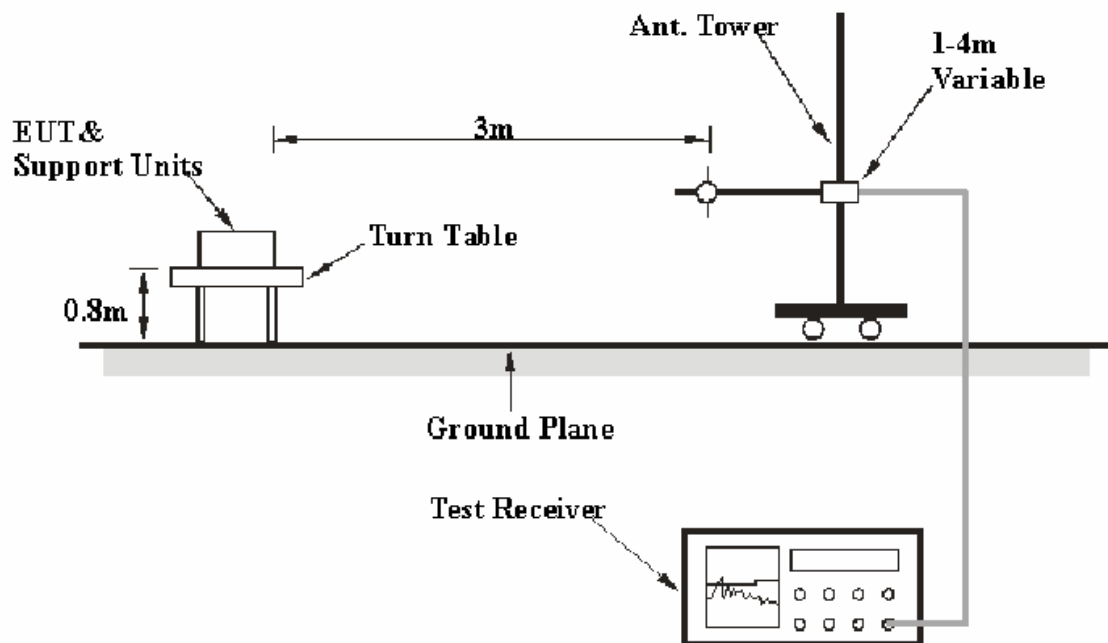
§15.209(a) §15.235(a) §15.205- RADIATED EMISSION

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:

13.47 dB at 199.40 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

Frequency (MHz)	Meter Reading dBuV/m	Detector PK/ AV	Direction Degree	Height Meter	Polar H / V	Antenna Factor (dB/m)	Cable loss (dB)	Amplifier Gain (dB)	Corr. Ampl. dBuV/m		
									Limit dBuV/m	Margin (dB)	Comment
199.40	42.57	126	1.6	V	11.6	1.86	26.0	30.03	43.5	13.47	Harmonic (QP)
498.50	35.07	268	1.3	V	18.0	2.81	27.1	28.78	46.0	17.22	Harmonic (QP)
498.50	34.65	148	1.2	H	18.0	2.81	27.1	28.36	46.0	17.64	Harmonic (QP)
49.85	81.21	153	1.5	V	7.1	0.54	26.8	62.05	80.0	17.95	Fundamental (AV)
249.25	40.08	120	1.5	V	9.9	2.22	26.0	26.20	46.0	19.80	Harmonic (QP)
249.25	38.65	56	1.3	H	9.9	2.22	26.0	24.77	46.0	21.23	Harmonic (QP)
199.40	34.56	103	1.5	H	11.6	1.86	26.0	22.02	43.5	21.48	Harmonic (QP)
49.85	88.22	153	1.5	V	7.1	0.54	26.8	69.06	100.0	30.94	Fundamental (PK)
49.85	65.75	246	1.2	H	7.1	0.54	26.8	46.59	80.0	33.41	Fundamental (AV)
49.85	72.51	246	1.2	H	7.1	0.54	26.8	53.35	100.0	46.65	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 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	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 (dBμV/m)	Limit (dBμV/m)	Margin (dB)
49.81	21.64	40	18.36
49.91	22.59	40	17.41

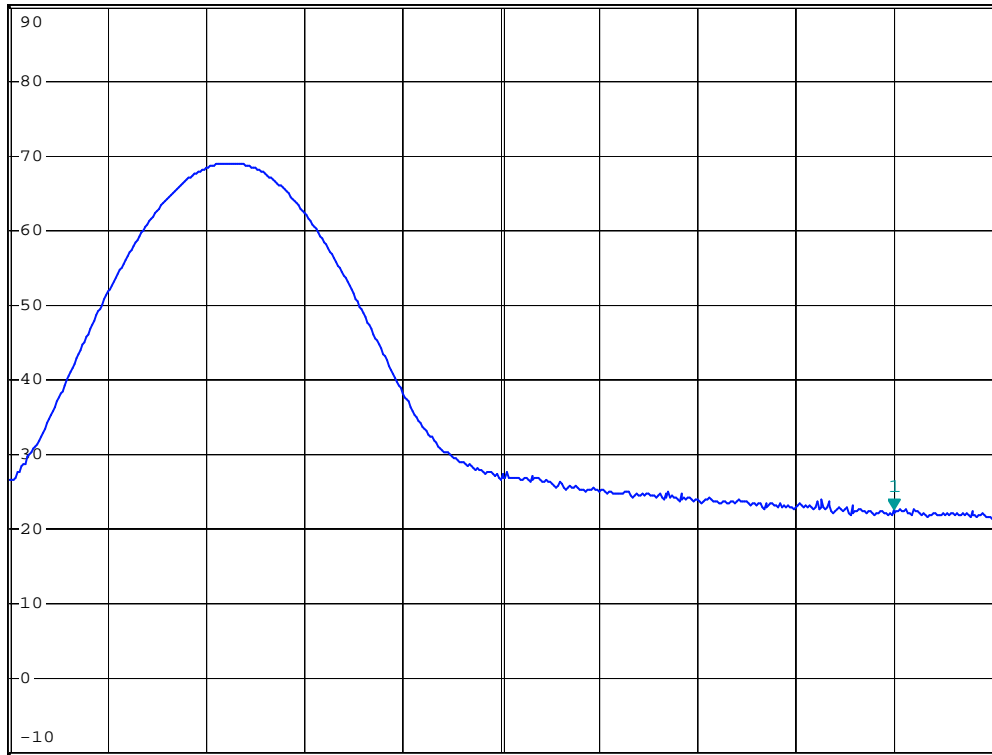


*RBW 10 kHz Marker 1 [T1]
VBW 30 kHz 22.59 dBμV
*SWT 300 ms 49.91000000 MHz

Ref 90 dBμV

*Att 10 dB

1 PK
MAXH



Start 49.82 MHz

10 kHz/

Stop 49.92 MHz

M/N:HP-WH2950 Bandedge2

Date: 26.DEC.2006 10:36:36