

FCC PART 15.249

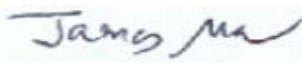
EMI MEASUREMENT AND TEST REPORT

For

Cheung Hung Electronics Ltd.

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FCC ID: TWXCHA808H

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| This Report Concerns: <input checked="" type="checkbox"/> Original Report | Product Name: 2.4GHz Cordless Phone – Handset |
| Test Engineer: James Ma  | |
| Report No.: R0601252(H) | |
| Report Date: 2006-02-10 | |
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Note: The test report is specially limited to the above company and this particular sample only. It may not be duplicated without prior written consent of Bay Area Compliance Laboratory Corporation. This report **must not** be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the US Government.

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *Cheung Hung Electronics Ltd.*'s product, FCC ID: *TWXCHA808H*, or the "EUT" as referred to in this report is a 2.4GHz Cordless Phone, handset portion. The Handset operates at frequency 2402.48-2409.004 MHz and measures approximately 177.8mmL x 43.2mmW x 30.5mmH.

* *The test data gathered are from production sample, serial number: 20060120001, provided by the manufacturer.*

EUT Photo



Objective

This document is a test report based on the Electromagnetic Interference (EMI) tests performed on the EUT. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4 - 2003.

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

Test Facility

The Test site used by Bay Area Compliance Laboratory Corporation to collect radiated and conducted emission measurement data is located at 230 Commercial Street, Sunnyvale, California 94085, USA.

Test site at Bay Area Compliance Laboratory Corporation has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. 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 and Voluntary Control Council for Interference has the reports on file and is listed under FCC registration number: 90464 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The current scope of accreditations can be found at <http://ts.nist.gov/ts/htdocs/210/214/scopes/2001670.htm>

SYSTEM TEST CONFIGURATION

Justification

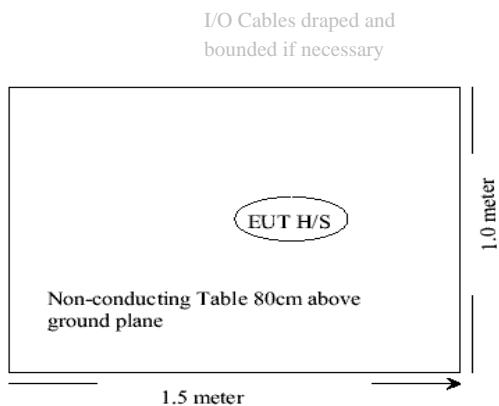
The EUT was configured for testing according to ANSI C63.4-2003.

Equipment Modifications

No modifications were made to the EUT.

Test Setup Block Diagram

Radiated Setup for Handset



SUMMARY OF TEST RESULTS

| FCC RULES | DESCRIPTION OF TEST | RESULT |
|--------------------------|---------------------|------------|
| §15.203 | Antenna Requirement | Compliant |
| §15.207(a) | Conducted Emission | N/A |
| §15.205 | Restricted Band | Compliant |
| §15.209 (a), §15.249 (a) | Radiated Emission | Compliant* |
| 15.249 (d) | Band Edge Testing | Compliant |

**Within the measurement uncertainty*

§15.203 - ANTENNA REQUIREMENT

Standard Applicable

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 with the device.

Antenna Connected Construction

The antenna connector is designed with permanent attachment and no consideration of replacement.

Antenna gain is 0 dBi, single port wire antenna.

§15.205, §15.209 (a), §15.249 (a), §15.249 (d) - RADIATED EMISSION DATA AND BAND-EDGE TESTING

Applicable Standard

According to §15.249 (a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

| Fundamental frequency | Field strength of (millivolts/ meter) | Field strength of fundamental 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 |

According to §15.249 (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.

Requirements: FCC 15.249 (c), the emission power at the START and STOP frequencies shall be at least 50 dB below the level of the fundamental or to the general radiated emission limits in FCC 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 BACL is ± 4.0 dB.

EUT Setup

The radiated emission tests were performed in the open area 3-meter test site, using the setup in accordance with ANSI C63.4-2003. The specification used was the FCC 15 Subpart C limits.

Environmental Conditions

| | |
|--------------------|----------|
| Temperature: | 17°C |
| Relative Humidity: | 45% |
| ATM Pressure: | 1009mbar |

**Testing was performed by James Ma on 2006-02-03.*

Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Cal. Date |
|-------------------|----------------------------------|-------------|-------------------|------------|
| Sonoma Instrument | Amplifier, Pre (10 KHz ~2.5 GHz) | 317 | 260407 | 03/20/2006 |
| Agilent | Analyzer, Spectrum | 8564A | 3943A01781 | 12/08/2005 |
| ETS- Lindgren | 30Mhz ~ 3 GHz Antenna | JB3 | A020106-2/S006628 | 02/14/2006 |
| A. H. Systems | Antenna, Horn, DRG | SAS-200/571 | 261 | 04/20/2005 |
| Agilent | Amplifier, Pre, Microwave | 8449B | 3008A01978 | 8/10/2005 |

* **Statement of Traceability:** BACL attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

Test Procedure

For the radiated emissions test, the power cord of the EUT was connected to the AC floor outlet.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT is compliant with all installation combinations.

All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limits), and are distinguished with a "Qp" in the data table.

Corrected Amplitude & Margin Calculation

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

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

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 for applicable limits. The equation for margin calculation is as follows:

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

Summary of Test Results

According to the recorded data in following table, the EUT measured test data within the measurement uncertainty of ± 4.0 , and had the worst margin of:

- 0.70* dB at 3203.00 MHz in the **Horizontal** polarization at Low Channel
- 0.70* dB at 3212.00 MHz in the **Horizontal** polarization at High Channel
- 14.6 dB at 752.00 MHz in the **Horizontal** polarization at Unintentional Emission

(*Within the measurement uncertainty)

Radiated Emissions Test Result Data, 3Meter

Low Channel

| Frequency | Reading | Direction | Height | Polar | Antenna Loss | Cable loss | Amplifier | Correction Factor | FCC | FCC | Comments |
|-----------|---------|-----------|--------|-------|--------------|------------|-----------|-------------------|--------------|-----------|--------------|
| MHz | dBuV/m | Degree | Meter | H / V | dB | dB | dB | dBuV/m | Limit dBuV/m | Margin dB | |
| 3203.000 | 55.8 | 45 | 1.5 | H | 30.80 | 2.30 | 35.6 | 53.30 | 54 | -0.70* | Ave |
| 3203.000 | 55.8 | 45 | 1.5 | V | 30.80 | 2.30 | 35.6 | 53.30 | 54 | -0.70* | Ave |
| 2402.484 | 98.4 | 45 | 1.2 | H | 28.30 | 2.10 | 36.4 | 92.40 | 94 | -1.60* | Fund/QP |
| 4804.968 | 51.2 | 45 | 1.0 | H | 33.40 | 2.88 | 35.2 | 52.28 | 54 | -1.72* | Ave |
| 4804.968 | 50.1 | 45 | 1.0 | V | 33.40 | 2.88 | 35.2 | 51.18 | 54 | -2.82* | Ave |
| 2402.484 | 94.5 | 45 | 1.2 | V | 28.30 | 2.10 | 36.4 | 88.50 | 94 | -5.50 | Fund/QP |
| 3203.000 | 65.7 | 45 | 2.0 | V | 30.80 | 2.30 | 35.6 | 63.20 | 74 | -10.80 | Peak |
| 3203.000 | 65.4 | 45 | 1.0 | H | 30.80 | 2.30 | 35.6 | 62.90 | 74 | -11.10 | Peak |
| 4804.968 | 58.1 | 45 | 1.0 | H | 33.40 | 2.88 | 35.2 | 59.18 | 74 | -14.82 | Peak |
| 4804.968 | 56.7 | 45 | 1.0 | V | 33.40 | 2.88 | 35.2 | 57.78 | 74 | -16.22 | Peak |
| 2400.000 | 31.7 | 60 | 1.5 | H | 28.30 | 2.10 | 36.4 | 25.70 | 54 | -28.30 | Band Edge/QP |
| 2400.000 | 30.0 | 60 | 1.5 | V | 28.30 | 2.10 | 36.4 | 24.00 | 54 | -30.00 | Band Edge/QP |

High Channel

| Frequency | Reading | Direction | Height | Polar | Antenna Loss | Cable loss | Amplifier | Correction Factor | FCC | FCC | Comments |
|-----------|---------|-----------|--------|-------|--------------|------------|-----------|-------------------|--------------|-----------|--------------|
| MHz | dBuV/m | Degree | Meter | H / V | dB | dB | dB | dBuV/m | Limit dBuV/m | Margin dB | |
| 3212.000 | 55.8 | 45 | 1.0 | H | 30.80 | 2.30 | 35.6 | 53.30 | 54 | -0.70* | Ave |
| 4818.008 | 52.2 | 45 | 1.0 | H | 33.40 | 2.88 | 35.2 | 53.28 | 54 | -0.72* | Ave |
| 3212.000 | 55.6 | 45 | 1.0 | V | 30.80 | 2.30 | 35.6 | 53.10 | 54 | -0.90* | Ave |
| 4818.008 | 52.0 | 45 | 1.0 | V | 33.40 | 2.88 | 35.2 | 53.08 | 54 | -0.92* | Ave |
| 2409.004 | 96.2 | 45 | 1.2 | H | 28.30 | 2.00 | 36.4 | 90.10 | 94 | -3.90* | Fund/QP |
| 2409.004 | 96.0 | 45 | 1.2 | V | 28.30 | 2.00 | 36.4 | 89.90 | 94 | -4.10 | Fund/QP |
| 3212.000 | 64.4 | 45 | 1.0 | H | 30.80 | 2.30 | 35.6 | 61.90 | 74 | -12.10 | Peak |
| 3212.000 | 64.1 | 45 | 1.0 | V | 30.80 | 2.30 | 35.6 | 61.60 | 74 | -12.40 | Peak |
| 4818.008 | 60.3 | 45 | 1.0 | H | 33.40 | 2.88 | 35.2 | 61.38 | 74 | -12.62 | Peak |
| 4818.008 | 60.1 | 45 | 1.0 | V | 33.40 | 2.88 | 35.2 | 61.18 | 74 | -12.82 | Peak |
| 2483.500 | 33.8 | 60 | 1.5 | V | 28.90 | 2.33 | 35.6 | 29.43 | 54 | -24.57 | Band Edge/QP |
| 2483.500 | 33.4 | 60 | 1.5 | H | 28.90 | 2.33 | 35.6 | 29.03 | 54 | -24.97 | Band Edge/QP |

Unintentional Emission

| Frequency | Reading | Direction | Height | Polar | Antenna Loss | Cable loss | Amplifier | Correction Factor | FCC | FCC |
|-----------|---------|-----------|--------|-------|--------------|------------|-----------|-------------------|--------------|-----------|
| MHz | dBuV/m | Degree | Meter | H/V | dB | dB | dB | dBuV/m | Limit dBuV/m | Margin dB |
| 752.00 | 37.1 | 280 | 3.0 | H | 20.6 | 2.1 | 28.4 | 31.4 | 46 | -14.6 |
| 702.00 | 36.8 | 260 | 1.0 | V | 19.6 | 2.1 | 28.3 | 30.2 | 46 | -15.8 |
| 509.10 | 37.2 | 330 | 1.0 | V | 17.8 | 1.8 | 28.5 | 28.3 | 46 | -17.7 |
| 515.60 | 36.7 | 180 | 2.5 | H | 18.1 | 1.3 | 28.5 | 27.6 | 46 | -18.4 |
| 393.20 | 36.5 | 90 | 2.0 | V | 15.2 | 1.2 | 28.1 | 24.8 | 46 | -21.2 |
| 319.00 | 36.2 | 180 | 1.5 | H | 13.8 | 1.0 | 27.5 | 23.5 | 46 | -22.5 |

*Within the measurement uncertainty