

FCC PART 15.249
EMI MEASUREMENT AND TEST REPORT

For
Cheung Hung Electronics Ltd.

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FCC ID: TWXCHA808H

This Report Concerns: <input checked="" type="checkbox"/> Original Report	Product Name: 2.4GHz Cordless Phone – Handset
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Report No.: R0601252(H)	
Report Date: 2006-02-10	
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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

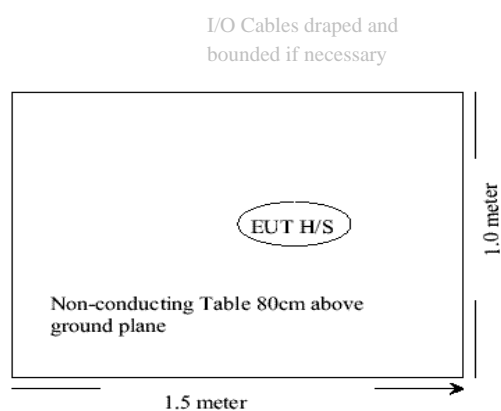
The EUT was configured for testing according to ANSI C63.4-2003.

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 (microvolts/ meter)	harmonics
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