

FCC PART 15.249

EMI MEASUREMENT AND TEST REPORT

For

**Qiaoxing Telecom Industry Co., Ltd.**

Qiaoxing Science Zone, Tangquan  
Huizhou City, Guangdong, P.R.C.

**FCC ID: R9WSTC-TC590-595**

<b>This Report Concerns:</b> <input checked="" type="checkbox"/> Original Report	<b>Equipment Type:</b> 5.8GHz Analog Cordless Phone - Handset
<b>Test Engineer:</b> <u>Snell Leong</u>	
<b>Report No.:</b> <u>R0409216</u>	
<b>Report Date:</b> <u>2004-10-18 / 2004-10-20</u>	
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## GENERAL INFORMATION

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### Product Description for Equipment Under Test (EUT)

The *Qiaoxing Telecom Industry Co., Ltd.*'s product, FCC ID: R9WSTC-TC590-595, or the "EUT" as referred to in this report is the handset of a cordless phone. The EUT operates at frequency 5862.7318 – 5874.0101 MHz. The EUT is measured approximately 175cmL x 50cmW x 30cmH.

\* *The test data gathered are from production sample, serial number: D203A008, provided by the manufacturer.*

### 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 - 2001.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, section 15.205, 15.207, and 15.249, 15.203, 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 - 2001, 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. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

### Test Facility

The Open Area Test site used by Bay Area Compliance Laboratory Corporation to collect radiated and conducted emission measurement data is located in the back parking lot of the building at 230 Commercial Street, Sunnyvale, California, 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 C63.4-2001.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 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, Bay Area Compliance Laboratory Corporation is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (NVLAP). The scope of the accreditation covers the FCC Method - 47 CFR Part 15 - Digital Devices, CISPR 22:1997 and AS/NZS 3548: Electromagnetic Interference - Limits and Methods of Measurement of Information Technology Equipment test methods under NVLAP Lab Code 200167-0.

## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

The EUT was configured for testing according to ANSI C63.4-2001.

The final qualification test was performed with the EUT operating at normal mode

### Equipment Modifications

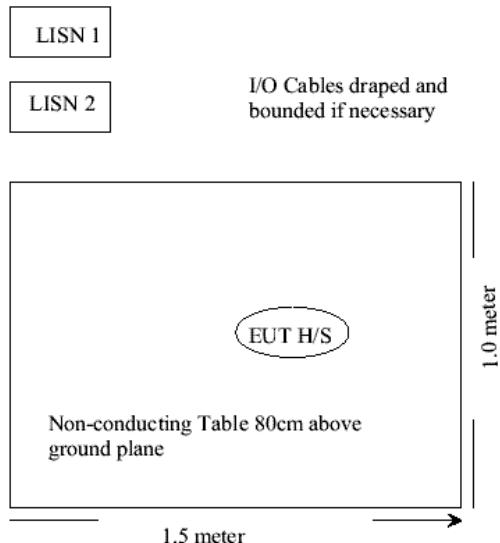
No modifications were made to the EUT.

### Configuration of Test System



Handset

### Test Setup Block Diagram



**SUMMARY OF TEST RESULTS**

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.203	Antenna Requirement	Compliant
§15.205	Restricted Bands of Operation	Compliant
§15.207 (a)	Conducted Emission	N/A
§15.209 (a), §15.249 (a)	Radiated Emission	Compliant
§15.249 (c)	Band Edge Testing	Compliant

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## **§15.203 - ANTENNA REQUIREMENT**

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### **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.

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**§ 15.249 (c) - CONDUCTED EMISSIONS TEST DATA**

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Not Applicable.

## §15.209(a) - RADIATED EMISSION DATA

### 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  $\pm 4.0$  dB.

### EUT Setup

The radiated emission tests were performed in the open area 3-meter test site, using the setup in accordance with ANSI C63.4-2001. The specification used was the FCC 15 Subpart C limits.

The spacing between the peripherals was 10 centimeters.

External I/O cables were draped along the edge of the test table and bundle as required.

### Spectrum Analyzer Setup

According to FCC Rules, 47 CFR 15.33 (a) (1), the system was tested to 25GHz.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

<u>Frequency Range</u>	<u>RBW</u>	<u>Video B/W</u>
Below 30MHz	10kHz	10kHz
30 – 1000MHz	100kHz	100kHz
Above 1000MHz	1MHz	1MHz

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
A. H System	Antenna, Horn, DRG	SAS-200/571	261	2004-09-02
HP	Amplifier, Pre	8447E	1937A01057	2004-08-04
HP	Amplifier, Pre, Microwave	8449E	3147A00400	2004-6-14
Agilent	Analyzer, Spectrum	8564E	3943A01781	2004-10-04

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

## Environmental Conditions

Temperature:	22 °C
Relative Humidity:	40%
ATM Pressure:	1013mbar

Testing was performed by Snell Leong on 2004-10-18.

## 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 $\mu$ V 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 $\mu$ V means the emission is 7dB $\mu$ V 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 complied with the FCC Title 47, Part 15, Subpart C, section 15.205, 15.207, and 15.249 after tested to 10<sup>th</sup> harmonics as required by FCC and had the worst margin of:

- 1.4 dB at 5862.7318 MHz in the Horizontal polarization at Low Channel
- 0.5 dB at 6846.4 MHz in the Horizontal polarization at Middle Channel
- 1.3 dB at 6853.002 MHz in the Horizontal polarization at High Channel
- 5.7 dB at 892.27 MHz in the Vertical polarization at Unintentional Emission

**Radiated Emissions Test Result Data, 3M**

INDICATED			TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15 Subpart C		
Frequency MHz	Ampl. dB $\mu$ V/m	Comments		Angle Degree	Height Meter	Polar H/V	Antenna dB	Cable dB		Corr. Ampl. dB $\mu$ V/m	Limit dB $\mu$ V/m	Margin dB
1GHz – 40GHz, Low Channel												
5862.7318	89.6	FUND/AVE	180	2.0	H	34.1	3.4	34.5	92.6	94	-1.4	
1782.6400	57.3	AVE	180	1.4	H	25.3	1.9	36.3	48.2	54	-5.8	
6839.8500	42.4	AVE	180	2.0	H	36.5	3.7	35.0	47.6	54	-6.4	
6839.8500	38.6	AVE	180	2.7	V	36.5	3.7	35.0	43.8	54	-10.2	
5862.7318	90.6	FUND/PEAK	180	2.0	H	34.1	3.4	34.5	93.6	104	-10.4	
5862.7318	80.3	FUND/AVE	0	3.1	V	34.1	3.4	34.5	83.3	94	-10.7	
2931.3600	46.2	AVE	180	2.7	V	29.0	2.4	35.5	42.1	54	-11.9	
6839.8500	56.4	PEAK	180	2.0	H	36.5	3.7	35.0	61.6	74	-12.4	
2931.3600	43.3	AVE	315	3.0	H	29.0	2.4	35.5	39.2	54	-14.8	
1782.6400	44.7	AVE	180	3.3	V	25.3	1.9	36.3	35.6	54	-18.4	
6839.8500	50.2	PEAK	180	2.7	V	36.5	3.7	35.0	55.4	74	-18.6	
2931.3600	58.5	PEAK	315	3.0	H	29.0	2.4	35.5	54.4	74	-19.6	
5862.7318	80.6	FUND/PEAK	0	3.1	V	34.1	3.4	34.5	83.6	104	-20.4	
2931.3600	57.7	PEAK	180	2.7	V	29.0	2.4	35.5	53.6	74	-20.4	
1782.6400	60.6	PEAK	180	1.4	H	25.3	1.9	36.3	51.5	74	-22.5	
1782.6400	55.9	PEAK	0	3.3	V	25.3	1.9	36.3	46.8	74	-27.2	
1GHz – 40GHz, Middle Channel												
6846.4000	48.3	AVE	270	4.0	H	36.5	3.7	35.0	53.5	54	-0.5	
5868.2260	88.5	FUND/AVE	180	2.1	H	34.1	3.4	34.5	91.5	94	-2.5	
8802.3300	38.6	AVE	180	3.0	V	37.8	5.0	33.8	47.6	54	-6.4	
6846.4000	41.9	AVE	180	1.8	V	36.5	3.7	35.0	47.1	54	-6.9	
1784.5700	55.9	AVE	180	4.0	H	25.3	1.9	36.3	46.8	54	-7.2	
2934.3200	50.1	AVE	90	3.8	H	29.0	2.4	35.5	46.0	54	-8.0	
1784.5700	55.0	AVE	45	2.2	V	25.3	1.9	36.3	45.9	54	-8.1	
5868.2260	82.5	FUND/AVE	200	1.4	V	34.1	3.4	34.5	85.5	94	-8.5	
8802.3300	35.3	AVE	180	2.0	H	37.8	5.0	33.8	44.3	54	-9.7	
5868.2260	90.1	FUND/PEAK	180	2.1	H	34.1	3.4	34.5	93.1	104	-10.9	
5868.2260	87.1	FUND/PEAK	200	1.4	V	34.1	3.4	34.5	90.1	104	-13.9	
6846.4000	54.9	PEAK	270	4.0	H	36.5	3.7	35.0	60.1	74	-13.9	
6846.4000	54.2	PEAK	180	1.8	V	36.5	3.7	35.0	59.4	74	-14.6	
2934.3200	42.3	AVE	130	3.0	V	29.0	2.4	35.5	38.2	54	-15.8	
8802.3300	46.3	PEAK	180	3.0	V	37.8	5.0	33.8	55.3	74	-18.7	
8802.3300	44.8	PEAK	180	2.0	H	37.8	5.0	33.8	53.8	74	-20.2	
2934.3200	57.3	PEAK	130	3.0	V	29.0	2.4	35.5	53.2	74	-20.8	
2934.3200	54.0	PEAK	90	3.8	H	29.0	2.4	35.5	49.9	74	-24.1	
1784.5700	58.3	PEAK	180	4.0	H	25.3	1.9	36.3	49.2	74	-24.8	
1784.5700	57.7	PEAK	45	2.2	V	25.3	1.9	36.3	48.6	74	-25.5	

**Radiated Emissions Test Result Data, 3M (Continued)**

INDICATED			TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15 Subpart C	
Frequency MHz	Ampl. dB $\mu$ V/m	Comments		Angle Degree	Height Meter	Polar H/V	Antenna dB $\mu$ V/m	Cable dB		Corr. Ampl. dB $\mu$ V/m	Limit dB $\mu$ V/m
1GHz – 40GHZ, High Channel											
6853.0020	47.5	AVE	200	1.8	H	36.5	3.7	35.0	52.7	54	-1.3
6853.0020	45.6	AVE	175	3.8	V	36.5	3.7	35.0	50.8	54	-3.2
2937.0100	54.1	AVE	60	2.6	H	29.0	2.4	35.5	50.0	54	-4.0
1786.4200	57.1	AVE	180	2.2	H	25.3	1.9	36.3	48.0	54	-6.0
5874.0101	84.5	FUND/AVE	120	2.2	H	34.1	3.4	34.5	87.5	94	-6.5
8811.0100	38.5	AVE	0	1.8	V	37.8	5.0	33.8	47.5	54	-6.5
5874.0101	84.2	FUND/AVE	110	2.0	V	34.1	3.4	34.5	87.2	94	-6.8
8811.0100	38.2	AVE	90	2.6	H	37.8	5.0	33.8	47.2	54	-6.8
6853.0020	56.9	PEAK	200	1.8	H	36.5	3.7	35.0	62.1	74	-11.9
2937.0100	45.6	AVE	330	2.2	V	29.0	2.4	35.5	41.5	54	-12.5
5874.0101	86.4	FUND/PEAK	120	2.2	H	34.1	3.4	34.5	89.4	104	-14.6
5874.0101	85.8	FUND/PEAK	110	2.0	V	34.1	3.4	34.5	88.8	104	-15.2
1786.4200	45.2	AVE	135	2.4	V	25.3	1.9	36.3	36.1	54	-17.9
6853.0020	50.6	PEAK	175	3.8	V	36.5	3.7	35.0	55.8	74	-18.2
8811.0100	44.6	PEAK	90	2.6	H	37.8	5.0	33.8	53.6	74	-20.4
2937.0100	57.4	PEAK	60	2.6	H	29.0	2.4	35.5	53.3	74	-20.7
8811.0100	43.5	PEAK	0	1.8	V	37.8	5.0	33.8	52.5	74	-21.5
2937.0100	56.3	PEAK	330	2.2	V	29.0	2.4	35.5	52.2	74	-21.8
1786.4200	59.5	PEAK	180	2.2	H	25.3	1.9	36.3	50.4	74	-23.6
1786.4200	56.5	PEAK	135	2.4	V	25.3	1.9	36.3	47.4	74	-26.6
3916.0000	46.0	PEAK	0	2.0	V	30.3	2.7	34.8	44.2	74	-29.8
4895.0100	42.2	PEAK	180	1.6	V	32.5	3.1	34.8	43.0	74	-31.0
Unintentional Emission, 30MHz to 1000MHz											
892.27	44.8		0	1.5	V	23.7	0.2	28.4	40.3	46	-5.7
978.05	45.09		30	1.8	V	23.9	0.2	28.1	41.1	54	-12.9
183.38	40.8		45	3.8	V	13.2	0.2	28.3	25.9	43.5	-17.6

## §15.249(c) – BAND-EDGE TESTING

### Standard Applicable

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.

### 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 spectrum analyzer with the START and STOP frequencies set to the EUT's operation band.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
A. H System	Antenna, Horn, DRG	SAS-200/571	261	2004-09-02
HP	Amplifier, Pre	8447E	1937A01057	2004-08-04
HP	Amplifier, Pre, Microwave	8449E	3147A00400	2004-6-14
Agilent	Analyzer, Spectrum	8564E	3943A01781	2004-10-04

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

### Environmental Conditions

Temperature:	22 °C
Relative Humidity:	40%
ATM Pressure:	1013mbar

Testing was performed by Snell Leong on 2004-10-13.

### Test Results

Refer to the attached plots.

