

Porta Phone Co. Inc.

Application
For
Certification

2.4GHz 40 Channel Full Duplex Wireless Walkphone

(FCC ID: B4HSLT2400)

06222091
KL/ Ann Choy
November 17, 2006

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LIST OF EXHIBITS

INTRODUCTION

<i>EXHIBIT 1:</i>	General Description
<i>EXHIBIT 2:</i>	System Test Configuration
<i>EXHIBIT 3:</i>	Emission Results
<i>EXHIBIT 4:</i>	Equipment Photographs
<i>EXHIBIT 5:</i>	Product Labelling
<i>EXHIBIT 6:</i>	Technical Specifications
<i>EXHIBIT 7:</i>	Instruction Manual
<i>EXHIBIT 8:</i>	Confidentiality Request

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MEASUREMENT/TECHNICAL REPORT

Porta Phone Co. Inc. - Model: SLT2400
FCC ID: B4HSLT2400

This report concerns (check one:) Original Grant X Class II Change

Equipment Type : DXT - Part 15 Low Power Transceiver, RX Verified

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes No X

If yes, defer until :
date

Company Name agrees to notify the Commission
by:

date

of the intended date of announcement of the product so that the grant can be issued
on that date.

Transition Rules Request per 15.37 ? Yes No X

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [04-05-05
Edition] Provision.

Report prepared by:

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Table of Contents

1.0 General Description	2
1.1 Product Description	2
1.2 Related Submittal(s) Grants	3
1.3 Test Methodology	3
1.4 Test Facility	3
2.0 System Test Configuration	5
2.1 Justification	5
2.2 EUT Exercising Software	5
2.3 Support Equipment List and Description	6
2.4 Measurement Uncertainty	7
2.5 Equipment Modification	7
3.0 Emission Results	9
3.1 Field Strength Calculation	10
3.2 Radiated Emission Configuration Photograph - Master Unit	11
3.3 Radiated Emission Data - Master Unit	12
3.4 Radiated Emission Configuration Photograph - Remote Unit	15
3.5 Radiated Emission Data - Remote Unit	16
3.6 Radiated Emission on the Bandedge	19
3.7 Line Conducted Configuration Photograph - Master Unit & Remote Unit	20
3.8 Line Conducted Emission Data - Master Unit & Remote Unit	21
4.0 Equipment Photographs	24
5.0 Product Labelling	26
6.0 Technical Specifications	28
7.0 Instruction Manual	30
8.0 Confidentiality Request	32

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List of attached file

Exhibit type	File Description	filename
Cover Page	Confidentiality Request	request.pdf
Test Report	Test Report	report.pdf
Operation Description	Technical Description	descri.pdf
Test Setup Photo	Radiated Emission for Master Unit	config photos.doc
Test Setup Photo	Radiated Emission for Remote Unit	config photos.doc
Test Report	Emission Plot	emission.pdf
Test Setup Photo	Conducted Emission	config photos.doc
Test Report	Conducted Emission Test Result	conduct.pdf
External Photo	External Photo	external photos.doc
Internal Photo	Internal Photo	internal photos.doc
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf

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EXHIBIT 1 GENERAL DESCRIPTION

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1.0 General Description

1.1 Product Description

The Equipment Under Test (EUT) is a 2.4GHz 40 Channel Full Duplex Wireless Walkphone. A master unit and a remote unit operate at frequency range of 2457.571MHz to 2461.744MHz and 2400.969MHz to 2405.142MHz respectively. Both units are powered by a 120VAC to 9VDC 200mA adaptor and/or a 4.8V 700mAh "Ni-MH" rechargeable battery. Each unit has a "Talk" button, which is used to communicate with each other, and it has a channel dip switch for selecting a channel. After turning on both unit and pressing a "Talk" button, both units act as full duplex transceivers with the same channel selection.

The remote unit is the same as the master unit in hardware aspect except different frequency range of transmission and reception and different components for this adjustment.

The circuit description is saved with filename: descri.pdf

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1.2 Related Submittal(s) Grants

This is an Application for Certification of low power transceivers. Two transmitters are included in this Application. This specific report details the emission characteristics of each transmitter. The receivers are subject to the verification authorization process, in accordance with 15.101(b). A verification report has been prepared for the receiver sections of each device.

1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2003). All measurements were performed in Open Area Test Sites. Preliminary scans were performed in the Open Area Test Sites only to determine worst case modes. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

1.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located at Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. This test facility and site measurement data have been fully placed on file with the FCC.

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EXHIBIT 2 SYSTEM TEST CONFIGURATION

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2.0 System Test Configuration

2.1 Justification

For emissions testing, the equipment under test (EUT) was setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables were manipulated to produce worst case emissions. The master unit and the remote unit were powered by a fully charged battery and/or an AC adaptor.

For the measurements, the EUT is attached to a plastic stand if necessary and placed on the wooden turntable. If the master unit attaches to peripherals, they are connected and operational (as typical as possible). The remote unit is remotely located as far from the antenna and the master unit as possible to ensure full power transmission from the master unit. Else, the master unit is wired to transmit full power without modulation.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

2.2 EUT Exercising Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use.

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2.3 Support Equipment List and Description

The FCC ID's for all equipment, plus descriptions of all cables used in the tested system are:

HARDWARE:

Two AC adaptors and two rechargeable batteries (provided with the units) were used to power the device. Its description is listed below.

- (1) An AC adaptor (120VAC to 9VDC 200mA, Model: PA-0920-DUA)
- (2) A 4.8V 700mAh Ni-MH type rechargeable battery

CABLES:

There are no special accessories necessary for compliance of this product.

OTHERS:

- (1) 2 x a headset with 1.2m unshielded cable permanently affixed. (Supplied by Client)

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2.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty test has been considered.

Uncertainty and Compliance - Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

2.5 Equipment Modification

Any modifications installed previous to testing by Porta Phone Co. Inc. will be incorporated in each production model sold/leased in the United States.

No modifications were installed by ETL Division, Intertek Testing Services Hong Kong Ltd.

All the items listed under section 2.0 of this report are confirmed by:

Confirmed by:

*Lam Chun Cheong, Kenneth
Senior Lead Engineer
Intertek Testing Services
Agent for Porta Phone Co. Inc.*



Signature

November 17, 2006

Date

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EXHIBIT 3 EMISSION RESULTS

3.0 **Emission Results**

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

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3.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG$$

where FS = Field Strength in $\text{dB}\mu\text{V}/\text{m}$
 RA = Receiver Amplitude (including preamplifier) in $\text{dB}\mu\text{V}$
 CF = Cable Attenuation Factor in dB
 AF = Antenna Factor in dB
 AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows:-

$$FS = RR + LF$$

where FS = Field Strength in $\text{dB}\mu\text{V}/\text{m}$
 $RR = RA - AG$ in $\text{dB}\mu\text{V}$
 $LF = CF + AF$ in dB

Assume a receiver reading of $52.0 \text{ dB}\mu\text{V}$ is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of $32 \text{ dB}\mu\text{V}/\text{m}$. This value in $\text{dB}\mu\text{V}/\text{m}$ was converted to its corresponding level in $\mu\text{V}/\text{m}$.

$RA = 52.0 \text{ dB}\mu\text{V}$	
$AF = 7.4 \text{ dB}$	$RR = 23.0 \text{ dB}\mu\text{V}$
$CF = 1.6 \text{ dB}$	$LF = 9.0 \text{ dB}$
$AG = 29.0 \text{ dB}$	
$FS = RR + LF$	
$FS = 23 + 9 = 32 \text{ dB}\mu\text{V}/\text{m}$	

Level in $\mu\text{V}/\text{m}$ = Common Antilogarithm $[(32 \text{ dB}\mu\text{V}/\text{m})/20] = 39.8 \mu\text{V}/\text{m}$

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3.2 Radiated Emission Configuration Photograph - Master Unit

Worst Case Radiated Emission

at 2457.571 MHz

For electronic filing, the worst case radiated emission configuration photographs are saved with filename: config photos.doc

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3.3 Radiated Emission Data - Master Unit

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

Judgement : Passed by 1.9 dB margin

TEST PERSONNEL:



Tester Signature

Jess Tang, Lead Engineer
Typed/Printed Name

November 17, 2006
Date

INTERTEK TESTING SERVICES

Company: Porta Phone Co. Inc.
Model: SLT2400
Mode : TX-Channel 01

Date of Test: September 22-October 20, 2006

Table 1, Master unit

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre- Amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
V	2457.571	95.7	33	29.4	92.1	94.0	-1.9
V	819.190	23.8	16	31.0	38.8	46.0	-7.2
H	1638.381	49.4	33	27.2	43.6	54.0	-10.4
H	3276.762	44.9	33	31.9	43.8	54.0	-10.2
H	*4915.143	44.1	33	34.9	46.0	54.0	-8.0
H	*7372.714	39.5	33	37.9	44.4	54.0	-9.6
H	9830.286	38.8	33	40.4	46.2	54.0	-7.8
H	*12287.857	34.5	33	40.5	42.0	54.0	-12.0

- NOTES:
1. Peak detector is used for the emission measurement.
 2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
 3. Negative value in the margin column shows emission below limit.
 4. Horn antenna is used for the emission over 1000MHz.
 5. Emissions radiated outside of the specified frequency bands, except harmonics, are attenuated by 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation, which meet the requirement of part 15.249(d).
- * Emission within the restricted band meets the requirement of part 15.205.

Test Engineer: Jess Tang

INTERTEK TESTING SERVICES

Company: Porta Phone Co. Inc.
Model: SLT2400
Mode : TX-Channel 40

Date of Test: September 22-October 20, 2006

Table 2, Master unit

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre- Amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
V	2461.744	95.6	33	29.4	92.0	94.0	-2.0
V	820.581	24.1	16	31.0	39.1	46.0	-6.9
H	1641.163	49.8	33	27.2	44.0	54.0	-10.0
H	3282.326	44.6	33	31.9	43.5	54.0	-10.5
H	*4923.489	43.6	33	34.9	45.5	54.0	-8.5
H	*7385.233	40.1	33	37.9	45.0	54.0	-9.0
H	9846.978	38.4	33	40.4	45.8	54.0	-8.2
H	*12308.722	33.6	33	40.5	41.1	54.0	-12.9

- NOTES: 1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. Emissions radiated outside of the specified frequency bands, except harmonics, are attenuated by 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation, which meet the requirement of part 15.249(d).
- * Emission within the restricted band meets the requirement of part 15.205.

Test Engineer: Jess Tang

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3.4 Radiated Emission Configuration Photograph - Remote Unit

Worst Case Radiated Emission

at 2405.142 MHz

For electronic filing, the worst case radiated emission configuration photographs are saved with filename: config photos.doc

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3.5 Radiated Emission Data - Remote Unit

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

Judgement : Passed by 3.0 dB margin

TEST PERSONNEL:



Tester Signature

Jess Tang, Lead Engineer
Typed/Printed Name

November 17, 2006
Date

INTERTEK TESTING SERVICES

Company: Porta Phone Co. Inc.
Model: SLT2400
Mode : TX-Channel 01

Date of Test: September 22-October 20, 2006

Table 3, Remote Unit

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre- Amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
V	2400.969	94.2	33	29.4	90.6	94.0	-3.4
V	800.323	23.9	16	31.0	38.9	46.0	-7.1
H	*1600.646	49.9	33	27.2	44.1	54.0	-9.9
H	3201.291	44.6	33	31.9	43.5	54.0	-10.5
H	*4801.937	45.1	33	34.9	47.0	54.0	-7.0
H	7202.906	39.5	33	37.9	44.4	54.0	-9.6
H	9603.874	37.7	33	40.4	45.1	54.0	-8.9
H	*12004.843	36.9	33	40.5	44.4	54.0	-9.6

- NOTES: 1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. Emissions radiated outside of the specified frequency bands, except harmonics, are attenuated by 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation, which meet the requirement of part 15.249(d).
- * Emission within the restricted band meets the requirement of part 15.205.

Test Engineer: Jess Tang

INTERTEK TESTING SERVICES

Company: Porta Phone Co. Inc.
Model: SLT2400
Mode : TX-Channel 40

Date of Test: September 22-October 20, 2006

Table 4, Remote Unit

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre- Amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
V	2405.142	94.6	33	29.4	91.0	94.0	-3.0
V	801.714	24.1	16	31.0	39.1	46.0	-6.9
H	*1603.428	49.6	33	27.2	43.8	54.0	-10.2
H	3206.855	45.5	33	31.9	44.4	54.0	-9.6
H	*4810.283	44.9	33	34.9	46.8	54.0	-7.2
H	7215.425	40.1	33	37.9	45.0	54.0	-9.0
H	9620.566	38.2	33	40.4	45.6	54.0	-8.4
H	*12025.708	36.6	33	40.5	44.1	54.0	-9.9

- NOTES: 1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. Emissions radiated outside of the specified frequency bands, except harmonics, are attenuated by 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation, which meet the requirement of part 15.249(d).
- * Emission within the restricted band meets the requirement of part 15.205.

Test Engineer: Jess Tang

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3.6 Radiated Emission on the Bandedge

From the following plots, they show that the fundamental emissions are confined in the specified band (2400MHz and 2483.5MHz). In case of the fundamental emissions are within two standard bandwidths from the bandedge, the delta measurement technique is used for determining bandedge compliance. Standard bandwidth is the bandwidth specified by ANSI C63.4 (2003) for frequency being measured.

Emissions radiated outside of the specified frequency bands, except harmonics, are attenuated by 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation, which meet the requirement of part 15.249(d).

Please refer to the following plots for radiated emission on the bandedge:

Plot M1A: Master Unit - Low Channel Emissions
Plot M1B: Master Unit - High Channel Emissions
Plot R1A: Remote Unit - Low Channel Emissions
Plot R1B: Remote Unit - High Channel Emissions

For electronic filing, the above plots are saved with filename: emission.pdf

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3.7 Line Conducted Configuration Photograph - Mater Unit & Remote Unit

Worst Case Line-Conducted Configuration

For electronic filing, the worst case line conducted configuration photographs are saved with filename: config photos.doc

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3.8 Line Conducted Emission Data - Mater Unit & Remote Unit

The data on the following pages list the significant emission frequencies, the limit, and the margin of compliance.

Judgement : Passed by more than 20 dB margin

TEST PERSONNEL:



Tester Signature

Jess Tang, Lead Engineer
Typed/Printed Name

November 17, 2006
Date

INTERTEK TESTING SERVICES

Company: Porta Phone Co. Inc.
Model: SLT2400

Date of Test: September 22-October 20, 2006

Conducted Emissions

For electronic filing, the conducted emission test result is saved with filename:
conduct.pdf

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EXHIBIT 4 EQUIPMENT PHOTOGRAPHS

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4.0 Equipment Photographs

For electronic filing, the photographs are saved with filename: external photos.doc & internal photos.doc

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EXHIBIT 5 PRODUCT LABELLING

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5.0 **Product Labelling**

For electronic filing, the FCC ID label artwork and location is saved with filename: label.pdf

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EXHIBIT 6 TECHNICAL SPECIFICATIONS

6.0 Technical Specifications

For electronic filing, the block diagram and circuit diagram are saved with filename: block.pdf and circuit.pdf respectively.

**EXHIBIT 7
INSTRUCTION MANUAL**

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7.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf

The required FCC Information to the User is stated on P.6 of the Instruction Manual.

This manual will be provided to the end-user with each unit sold/leased in the United States.

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EXHIBIT 8 CONFIDENTIALITY REQUEST

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8.0 Confidentiality Request

For electronic filing, a preliminary copy of the Confidentiality Request is saved with filename: request.pdf