HKC Technology Ltd.

Application
For
Certification

5.8GHz 10 Channel Digital Direct Sequence Spectrum Cordless Telephone System with Caller ID and Digital Answering Machine

(FCC ID: RTZ238)

03201611
TL/Ann Choy
March 1, 2004

FCC ID: RTZ238

Intertek Testing Services Hong Kong Ltd.
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LIST OF EXHIBITS

MEASUREMENT/TECHNICAL REPORT

HKC Technology Ltd.- MODEL: WMC, WDE, WHE
FCC ID: RTZ238

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

Equipment Type: DSS-Part 15 Spread Spectrum Transmitter and Class B Personal Computer Peripheral

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

If yes, defer until : _____
dae

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 [12-08-03 Edition] provision.

Report prepared by:

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List of attached file

Exhibit type	File Description	filename
Test Report	Test Report	report.pdf
Operation Description	Technical Description	descri.pdf
Test Setup Photo	Radiated Emission for Base	config photos.doc
Test Setup Photo	Radiated Emission for Handset	config photos.doc
Test Report	Maximum Output Power Plot	bmaxop.pdf, hmaxop.pdf, dmaxop.pdf
Test Report	6 dB Bandwidth Plot	b6dB.pdf, h6dB.pdf, d6dB.pdf
Test Report	Maximum Power Density Reading	bpowden.pdf, hpowden.pdf, dpowden.pdf
Test Report	Out Band Antenna Conducted Emission Plot	bobantcon.pdf, hobantcon.pdf, dobantcon.pdf
Test Report	Duty Cycle Calculation and Measurement	bdcc.pdf, hdcc.pdf, ddcc.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_base.doc internal photos_handset.doc internal photos_desktop.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_base.pdf manual_handset.pdf manual_desktop.pdf
User Manual	FCC Information	FCC information.pdf
RF Exposure Info	RF Safety	RF exposure info.pdf
Operation Descerption	Security Code Information	security code information.pdf

EXHIBIT 1
SUMMARY OF TEST RESULTS

1.0 Summary of Test

HKC Technology Ltd.- MODEL: WMC, WDE, WHE
FCC ID: RTZ238

TEST	REFERENCE	RESULTS
Max. Output Power	15.247(b)	Pass
6 dB Bandwidth	15.247(a)(2)	Pass
Max. Power Density	15.247(d)	Pass
Out of Band Antenna Conducted Emission	15.247(c)	Pass
Radiated Emission in Restricted Bands	15.247(c)	Pass
AC Conducted Emission	15.207	Pass
Radiated Emission from Digital Part	15.109	Pass
Antenna Requirement	15.203	Pass (See Notes)

Notes: The EUT uses a permanently attached antenna which, in accordance to Section 15.203, is considered sufficient to comply with the provisions of this section.

EXHIBIT 2
GENERAL DESCRIPTION

2.0 **General Description**

2.1 Product Description

The models WMC, WDE, and WHE are 5.8GHz 10 Channel Digital Direct Sequence Spectrum Cordless Telephone System with Caller ID and Digital Answering Machine. It operates at frequency range of 5731.920MHz to 5791.824MHz. The unit is capable of either tone or pulse dialing. The internal power supply's isolation is accomplished through a power transformer having an adequate dielectric rating. The circuit wiring is consistent under the requirement of part 68.

The model of WMC is a main base unit which has a page key to page corresponding handset unit or desktop unit. In addition, the unit has other functional keys such as set and reset.

The model of WHE is a cordless handset unit which is a part of a cordless telephone system. It consists of a keypad with twelve standard keys (0,...9,*,#), seven function keys (Three soft keys, Up, Down, Menu, Redial, Intercom, Speaker). A Talk key and a END key are provided to control pick and release telephone line in a toggle base.

The model of WDE is a cordless desktop unit which is also a part of a cordless telephone system. It consists of a keypad with twelve standard keys (0,...9,*,#), fifteen function keys (Three soft keys, Up, Down, Menu, Redial, flash, L1, L2, L3, Voice Mail, Volume Up, Volume Down, Mute, Intercom, Speaker).

The antennas used in base unit, handset unit, and desktop unit are integral, and the test sample is a prototype.

The circuit description and frequency hopping algorithm is saved with filename: descri.pdf

Connection between the device and the telephone network is accomplished through the use of USOC RJ11C in the 2-wire loop calling central office line.

2.2 Related Submittal(s) Grants

This is an application for Certification of a DSS-Part 15 Spread Spectrum Cordless Telephone System and a Class B Personal Computer Peripheral. Three transmitters are included in this application. The device is also subject to Part 68 Registration.

2.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2001). 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. All other measurements were made in accordance with the procedures in part 2 of CFR 47.

2.4 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.

EXHIBIT 3
SYSTEM TEST CONFIGURATION

3.0 **System Test Configuration**

3.1 Justification

For emission testing, the equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). During testing, all cables were manipulated to produce worst case emissions. The handset was powered by a fully charged battery.

For the measurements, the EUT is attached to a plastic stand if necessary and placed on the wooden turntable. If the base unit attaches to peripherals, they are connected and operational (as typical as possible). The handset is remotely located as far from the antenna and the base as possible to ensure full power transmission from the base. Else, the base 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. Detector function is in peak mode. 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 1000MHz. The resolution is 1MHz or greater for frequencies above 1000MHz.

Radiated emission measurement were performed from the lowest radio frequency signal generated in the device which is greater than 9kHz to 40GHz.

3.2 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.

For emissions testing, the units were setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing.

3.3 Support Equipment List and Description

The FCC ID's for all equipment, plus descriptions of all cables used in the tested system (included inserted cards, which have grants) are:

HARDWARE:

The unit was operated standalone. An AC adapter (provided with the unit) was used to power the device. Its description is listed below.

(1) 1 x AC adapter for base unit (100VAC-120VAC to 9VDC 1.4A) with two meter unshielded power cord permanently affixed.
(2) 2 x AC adapter for desktop unit (120VAC to 9VDC 500mA) with two meter unshielded power cord permanently affixed.

CABLES:

Supplied by Intertek:

(1) 3 x Telecommunication cable with RJ11C connectors (1m, unshielded) 600Ω terminated.
(2) 3 x Telecommunication cable with RJ11C connectors (1m, unshielded)
(3) 1 x RS-232 serial cable with 1.2m long
(4) 1 x 2.5mm stereo cable with 1.2m long

OTHERS:

Supplied by Intertek:

(1) Compaq Computer, Model: D510S, S/N: 3Z2AKN9ZJ023, DOC Product
(2) TopVision LCD Monitor, Model 03761428, S/N: M0034H02390020, DOC Product
(3) Compaq Keyboard, Model: KB-0133, S/N: B55940EGANR0CE, DOC Product
(4) Compaq Mouse, Model: M-S69, FCCID: JNZ211443
(5) Hayes Modem, Model: 6800CN, FCCID: BFJ9D907-00038
(6) HP Printer, Model: C2642A, S/N: SG67B131RY, FCCID: B94C2642X
(7) Lenoxx Sound Walkman, Model: 935, FCC Part15 Verification
(8) A headset for telephone use with 1.2m unshielded cable permanently affixed.

3.4 Measurement Uncertainty

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

3.5 Equipment Modification

Any modifications installed previous to testing by HKC Technology Ltd. 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 3.0 of this report are confirmed by:

Confirmed by:

Tommy Leung
Supervisor
Intertek Testing Services Hong Kong Ltd.
Agent for HKC Technology Ltd.

Signature

March 8, 2004 Date

EXHIBIT 4
MEASUREMENT RESULTS

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WMC

4.0 Measurement Results

4.1 Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b) :

[ ] The antenna power of the EUT was connected to the input of a power meter. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.

[×] The antenna port of the EUT was connected to the input of a spectrum analyzer. The analyzer was set for RBW>20dB bandwidth and power was read directly in dBm. External attenuation and cable loss were compensated for using the OFFSET function of the analyser.

For antennas with gains of 6 dBi or less, maximum allowed transmitter output is 1 watt (+30 dBm).

For antennas with gains greater than 6 dBi, transmitter output level must be decreased by an amount equal to (GAIN - 6) dBm.

(Base Unit) Antenna Gain = 2 dBi			
Frequency (MHz)		Output in dBm	Output in mWatt
Low Channel:	5730.990	10.00	10.00
Middle Channel:	5759.040	9.34	8.59
High Channel:	5792.110	10.47	11.14

Cable loss : 0.5 dB External Attenuation : N/A dB

Cable loss, external attenuation: [x] included in OFFSET function
[ ] added to SA raw reading

EUT Transmit Antenna Gain(dBi) + dBm max. output level = 12.47 dBm (36 dBm or less)

Please refer to the attached plots for details:

Plot B1a: Low Channel Output Power
Plot B1b: Middle Channel Output Power
Plot B1c: High Channel Output Power

For electronic filing, the above plots is saved with filename: bmaxop.pdf

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WHE

Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b) - Continued:

(Handset Unit) Maximum Antenna Gain = -1 dBi			
Frequency (MHz)		Output in dBm	Output in mWatt
Low Channel:	5731.490	15.97	39.54
Middle Channel:	5759.330	16.03	40.09
High Channel:	5791.570	14.84	30.48

Cable loss : 0.5 dB External Attenuation : N/A dB

Cable loss, external attenuation: [x] included in OFFSET function
[ ] added to SA raw reading

EUT Transmit Antenna Gain(dBi) + dBm max. output level = 15.03 dBm (36 dBm or less)

Please refer to the attached plots for details:

Plot H1a: Low Channel Output Power
Plot H1b: Middle Channel Output Power
Plot H1c: High Channel output Power

For electronic filing, the above plots is saved with filename: hmaxop.pdf

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WDE

Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b) - Continued:

(Desktop Unit) Maximum Antenna Gain = -1 dBi			
Frequency (MHz)		Output in dBm	Output in mWatt
Low Channel:	5731.251	7.84	6.08
Middle Channel:	5759.311	6.53	4.50
High Channel:	5791.010	5.16	3.28

Cable loss : 0.5 dB External Attenuation : N/A dB

Cable loss, external attenuation: [x] included in OFFSET function
[ ] added to SA raw reading

EUT Transmit Antenna Gain(dBi) + dBm max. output level = 6.84 dBm (36 dBm or less)

Please refer to the attached plots for details:

Plot D1a: Low Channel Output Power
Plot D1b: Middle Channel Output Power
Plot D1c: High Channel output Power

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

For RF Safety of base unit, handset, and desktop unit, the information is saved with filename: RF exposure info.pdf.

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WMC

4.2 Maximum 6 dB RF Bandwidth, FCC Rule 15.247(a)(2):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was chosen so that the display was a result of the hopping channel modulation. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6 dB bandwidth was determined from where the channel output spectrum intersected the display line.

(Base Unit)	
Frequency (MHz)	6 dB Bandwidth (kHz)
5791.767	1354

Refer to the following plots for 6 dB bandwidth sharp:

Plot B2a: Low Channel 6 dB RF Bandwidth
Plot B2b: Middle Channel 6 dB RF Bandwidth
Plot B2c: High Channel 6 dB RF Bandwidth

Limit: at least 500kHz

For electronic filing, the above plots are saved with filename: b6dB.pdf

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WHE

Maximum 6 dB RF Bandwidth, FCC Rule 15.247(a)(2) - Continued:

(Handset Unit)	
Frequency (MHz)	6 dB Bandwidth (kHz)
5791.870	1309

Refer to the following plots for 6 dB bandwidth sharp:

Plot H2a: Low Channel 6 dB RF Bandwidth
Plot H2b: Middle Channel 6 dB RF Bandwidth
Plot H2c: High Channel 6 dB RF Bandwidth

Limit: at least 500kHz

For electronic filing, the above plots are saved with filename: h6dB.pdf

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WDE

Maximum 6 dB RF Bandwidth, FCC Rule 15.247(a)(2) - Continued:

(Desktop Unit)	
Frequency (MHz)	6 dB Bandwidth (kHz)
5731.989	1366

Refer to the following plots for 6 dB bandwidth sharp:

Plot D2a: Low Channel 6 dB RF Bandwidth
Plot D2b: Middle Channel 6 dB RF Bandwidth
Plot D2c: High Channel 6 dB RF Bandwidth

Limit: at least 500kHz

For electronic filing, the above plots are saved with filename: d6dB.pdf

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WMC

4.3 Maximum Power Density Reading, FCC Rule 15.247(d):

The spectrum analyzer RES BW was set to 3 kHz. The START and STOP frequencies were set to the band edges of the maximum output passband. If there is no clear maximum amplitude in any given portion of the band, it may be necessary to make measurements at a number of bands defined by several START and STOP frequency pairs. The specification calls for a 1 second interval at each 3 kHz bandwidth; total SWEEP TIME is calculated as follows:

SWEEP TIME (SEC) = (Fstop, kHz - Fstart, kHz)/ 3 kHz

Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator or and/ or cable as used, these losses are compensated for with the analyzer OFFSET function.

Frequency (MHz)	Power Density (dBm)
5792.315	-2.34

Frequency Span = 1.5 MHz

Sweep Time = Frequency Span/ 3 kHz = 500 seconds

Cable Loss: 0.5 dB

Limit: 8dBm

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

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WHE

4.3 Maximum Power Density Reading, FCC Rule 15.247(d):

The spectrum analyzer RES BW was set to 3 kHz. The START and STOP frequencies were set to the band edges of the maximum output passband. If there is no clear maximum amplitude in any given portion of the band, it may be necessary to make measurements at a number of bands defined by several START and STOP frequency pairs. The specification calls for a 1 second interval at each 3 kHz bandwidth; total SWEEP TIME is calculated as follows:

SWEEP TIME (SEC) = (Fstop, kHz - Fstart, kHz)/ 3 kHz

Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator or and/ or cable as used, these losses are compensated for with the analyzer OFFSET function.

Frequency (MHz)	Power Density (dBm)
5791.218	3.16

Frequency Span = 1.5 MHz

Sweep Time = Frequency Span/ 3 kHz = 500 seconds

Cable Loss: 0.5 dB

Limit: 8dBm

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

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WDE

4.3 Maximum Power Density Reading, FCC Rule 15.247(d):

The spectrum analyzer RES BW was set to 3 kHz. The START and STOP frequencies were set to the band edges of the maximum output passband. If there is no clear maximum amplitude in any given portion of the band, it may be necessary to make measurements at a number of bands defined by several START and STOP frequency pairs. The specification calls for a 1 second interval at each 3 kHz bandwidth; total SWEEP TIME is calculated as follows:

SWEEP TIME (SEC) = (Fstop, kHz - Fstart, kHz)/ 3 kHz

Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator or and/ or cable as used, these losses are compensated for with the analyzer OFFSET function.

Frequency (MHz)	Power Density (dBm)
5759.025	-4.81

Frequency Span = 1.5 MHz

Sweep Time = Frequency Span/ 3 kHz = 500 seconds

Cable Loss: 0.5 dB

Limit: 8dBm

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

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WMC, WHE, WDE

4.4 Out of Band Conducted Emissions, FCC Rule 15.247(c):

In any 100 kHz bandwidth outside the EUT passband, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission, or else shall meet the general limits for radiated emissions at frequencies outside the passband, whichever results in lower attenuation.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

Refer to the following plots for out of band conducted emissions data:

Base Unit:

Plot B6a.1- B6a.6: Low Channel Emissions (Limit Line: 8dBm - 20dB = -12dBm)
Plot B6b.1- B6b.6: Middle Channel Emissions (Limit Line: 7.41dBm - 20dB = -12.59dBm)
Plot B6c.1- B6c.6: High Channel Emissions (Limit Line: 7.94dBm - 20dB = -12.06dBm)
Plot B6d.1- B6d.2: Modulation Products Emissions

Handset:

Plot H6a.1- H6a.6: Low Channel Emissions (Limit Line: 12.44dBm - 20dB = -7.56dBm)
Plot H6b.1- H6b.6: Middle Channel Emissions (Limit Line: 13.16dBm - 20dB = 6.84dBm)
Plot H6c.1- H6c.6: High Channel Emissions (Limit Line: 14.31dBm - 20dB = -5.69dBm)
Plot H6d.1- H6d.2: Modulation Products Emissions

Desktop:

Plot D6a.1- D6a.6: Low Channel Emissions (Limit Line: 5.69dBm - 20dB = -14.31dBm)
Plot D6b.1- D6b.6: Middle Channel Emissions (Limit Line: 4.28dBm - 20dB = -15.72dBm)
Plot D6c.1- D6c.6: High Channel Emissions (Limit Line: 2.56dBm - 20dB = -17.44dBm)
Plot D6d.1- D6d.2: Modulation Products Emissions

The plots showed the 2nd harmonic and modulation products at the band edges of 5725 MHz and 5850 MHz. In addition, all spurious emission and up to 40GHz was measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

For electronic filing, the above plots are saved with filenames: bobantcon.pdf, hobantcon.pdf, dobantcon.pdf

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WMC, WHE, WDE

4.5 Out of Band Radiated Emissions (for emissions in 4.4 above that are less than 20 dB below carrier), FCC Rule 15.247(c):

For out of band emissions that are close to or that exceed the 20dB attenuation requirement described in the specification, radiated measurements were performed at a 3m separation distance to determine whether these emissions complied with the general radiated emission requirement.

[×] Not required
[ ] See attached data sheet

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WMC, WHE, WDE

4.6 Transmitter Radiated Emissions in Restricted Bands, FCC Rule 15.35(b), (c):

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. All measurements were performed with peak detection unless otherwise specified.

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

4.7 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

FS = RA + AF + CF - AG + PD + AV

where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB
PD = Pulse Desensitization in dB
AV = Average Factor in -dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

FS = RA + AF + CF - AG + PD + AV

Example
Assume a receiver reading of 62.0 dBμV 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. The pulse desensitization factor of the spectrum analyzer was 0 dB, and the resultant average factor was -10 dB. The net field strength for comparison to the appropriate emission limit is 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 62.0 dBμV
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
PD = 0 dB
AV = -10 dB
FS = 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32 dBμV/m

Level in mV/m = Common Antilogarithm [(32 dBμV/m)/20] = 39.8 μV/m

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WMC

4.8 Radiated Emission Configuration Photograph - Base Unit

Worst Case Radiated Emission
at
11463.840 MHz

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

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WMC

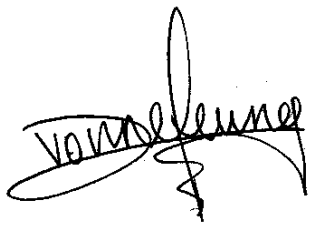
4.9 Radiated Emission Data - Base Unit

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

Judgement : Passed by 2.3 dB

****

TEST PERSONNEL:



Tester Signature

Yvonne Leung, Engineer
Typed/Printed Name

March 1, 2004
Date

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WMC
Mode : TX-Channel 0

Table 1, Base Unit

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (-dB)	Net 3m at (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
V	*11463.840	58.5	34	40.2	13.0	51.7	54	-2.3
V	*22927.680	37.4	34	45.3	13.0	35.7	54	-18.3

NOTES: 1. Peak Detector data

2. All measurements were made at 3 meters. Harmonic 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 harmonic 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 and average detector are used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Test Engineer: Yvonne Leung

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WMC
Mode : TX-Channel 5

Table 2, Base Unit

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (-dB)	Net 3m at (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
V	*11519.136	57.9	34	40.6	13.0	51.5	54	-2.5
V	*23038.272	37.2	34	45.3	13.0	35.5	54	-18.5

NOTES: 1. Peak Detector data

2. All measurements were made at 3 meters. Harmonic 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 harmonic 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 and average detector are used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Test Engineer: Yvonne Leung

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WMC
Mode : TX-Channel 9

Table 3, Base Unit

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (-dB)	Net 3m at (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
V	*11583.648	57.4	34	40.6	13.0	51.0	54	-3.0

NOTES: 1. Peak Detector data

2. All measurements were made at 3 meters. Harmonic 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 harmonic 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 and average detector are used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Test Engineer: Yvonne Leung

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WHE

4.10 Radiated Emission Configuration Photograph - Handset

Worst Case Radiated Emission
at
11463.840 MHz

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

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WHE

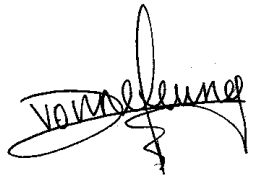
4.11 Radiated Emission Data - Handset

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

Judgement : Passed by 1.9 dB compare with the peak limit

****

TEST PERSONNEL:



Tester Signature

Yvonne Leung, Engineer
Typed/Printed Name

March 1, 2004
Date

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WHE
Mode : TX-Channel 0

Table 4, Handset

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (-dB)	Net 3m at (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
V	*11463.840	65.9	34	40.2	28.6	43.5	54	-10.5
V	*22927.680	37.0	34	45.3	28.6	19.7	54	-34.3

NOTES: 1. Peak Detector data

2. All measurements were made at 3 meters. Harmonic 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 harmonic 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 and average detector are used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function, and this is the worst-case of 1.9dB margin at 11463.840MHz.

Test Engineer: Yvonne Leung

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WHE
Mode : TX-Channel 5

Table 5, Handset

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (-dB)	Net 3m at (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
V	*11519.136	63.2	34	40.6	28.6	41.2	54	-12.8
V	*23038.272	37.2	34	45.3	28.6	19.9	54	-34.1

NOTES: 1. Peak Detector data

2. All measurements were made at 3 meters. Harmonic 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 harmonic 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 and average detector are used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Test Engineer: Yvonne Leung

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WHE
Mode : TX-Channel 9

Table 6, Handset

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (-dB)	Net 3m at (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	*11583.648	64.0	34	40.6	28.6	42.0	54	-12.0

NOTES: 1. Peak Detector data

2. All measurements were made at 3 meters. Harmonic 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 harmonic 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 and average detector are used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Test Engineer: Yvonne Leung

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WDE

4.12 Radiated Emission Configuration Photograph - Desktop Unit

Worst Case Radiated Emission
at
11583.648 MHz

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

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WDE

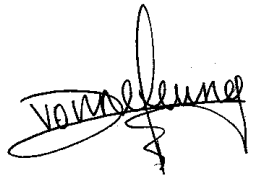
4.13 Radiated Emission Data - Desktop Unit

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

Judgement : Passed by 3.4 dB compare with the peak limit

****

TEST PERSONNEL:



Tester Signature

Yvonne Leung, Engineer
Typed/Printed Name

March 1, 2004
Date

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WDE
Mode : TX-Channel 0

Table 7, Desktop Unit

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (-dB)	Net 3m at (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
V	*11463.840	62.5	34	40.2	28.6	40.1	54	-13.9
V	*22927.680	37.5	34	45.3	28.6	20.2	54	-33.8

NOTES: 1. Peak Detector data

2. All measurements were made at 3 meters. Harmonic 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 harmonic 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 and average detector are used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Test Engineer: Yvonne Leung

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WDE
Mode : TX-Channel 5

Table 8, Desktop Unit

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (-dB)	Net 3m at (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
V	*11519.136	63.2	34	40.6	28.6	41.2	54	-12.8
V	*23038.272	37.4	34	45.3	28.6	20.1	54	-33.9

NOTES: 1. Peak Detector data

2. All measurements were made at 3 meters. Harmonic 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 harmonic 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 and average detector are used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Test Engineer: Yvonne Leung

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WDE
Mode : TX-Channel 9

Table 9, Desktop Unit

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (-dB)	Net 3m at (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	*11583.648	64.0	34	40.6	28.6	42.0	54	-12.0

NOTES: 1. Peak Detector data

2. All measurements were made at 3 meters. Harmonic 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 harmonic 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 and average detector are used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function, and this is the worst-case of 3.4dB margin at 11583.648Mhz.

Test Engineer: Yvonne Leung

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WMC, WDE

4.14 AC Line Conducted Emission, FCC Rule 15.207:

[ ] Not required; battery operation only

[×] Test data attached

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WMC

4.15 Line Conducted Configuration Photograph - Base

Worst Case Line-Conducted Configuration

at 0.455 MHz

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

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WMC

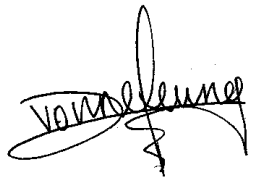
4.16 Line Conducted Emission Data

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

Judgement : Passed by more than 7.0 dB margin

For electronic filing, the worst case line conducted emission data are saved with filename: conduct.pdf

TEST PERSONNEL:



Tester Signature

Yvonne Leung, Engineer
Typed/Printed Name

March 1, 2004
Date

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WDE

4.17 Line Conducted Configuration Photograph - Desktop Unit

Worst Case Line-Conducted Configuration

at 20.000 MHz

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

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WDE

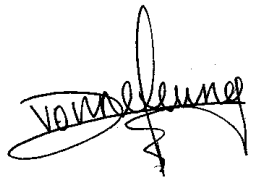
4.18 Line Conducted Emission Data

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

Judgement : Passed by more than 17.7 dB margin

For electronic filing, the worst case line conducted emission data are saved with filename: conduct.pdf

TEST PERSONNEL:



Tester Signature

Yvonne Leung, Engineer
Typed/Printed Name

March 1, 2004
Date

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WMC

4.19 Line Conducted Configuration Photograph - Class B Personal Computer Peripheral

Worst Case Line-Conducted Configuration

at 0.455 MHz

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

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WMC

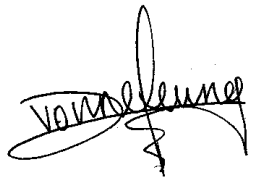
4.20 Line Conducted Emission Data

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

Judgement : Passed by more than 10.2 dB margin

For electronic filing, the worst case line conducted emission data are saved with filename: conduct.pdf

TEST PERSONNEL:



Tester Signature

Yvonne Leung, Engineer
Typed/Printed Name

March 1, 2004
Date

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WMC, WHE, WDE

4.21 Radiated Emissions from Digital Section of Transceiver (Transmitter) and Class B Personal Computer Peripheral, FCC Ref: 15.109

[ ] Not required - No digital part

[×] Test results are attached

[ ] Included in the separated DOC report.

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WMC
Mode: Talk

Table 10, Base Unit

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit (dBµV/m)	Margin (dB)
V	31.101	28.2	16	11.6	23.8	40.0	-16.2
V	34.556	28.9	16	11.6	24.5	40.0	-15.5
V	38.011	30.1	16	11.2	25.3	40.0	-14.7
V	41.466	30.7	16	11.7	26.4	40.0	-13.6
V	44.921	31.3	16	11.7	27.0	40.0	-13.0
V	48.376	30.9	16	11.9	26.8	40.0	-13.2

NOTES: 1. Quasi-peak detector is used for the emission below or equal to 1000 MHz.

2. All measurements were made at 3 meters. Harmonic 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 harmonic 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 and average detector are used for the emission over 1000MHz.

Test Engineer: Yvonne Leung

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WHE
Mode: Talk

Table 11, Handset

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit (dBµV/m)	Margin (dB)
V	41.471	28.7	16	11.7	24.4	40.0	-15.6
V	55.296	30.6	16	11.0	25.6	40.0	-14.4
V	69.121	33.9	16	8.5	26.4	40.0	-13.6
V	82.946	36.8	16	6.7	27.5	40.0	-12.5
V	96.771	33.4	16	10.6	28.0	43.5	-15.5
V	110.596	31.2	16	12.6	27.8	43.5	-15.7

NOTES: 1. Quasi-peak detector is used for the emission below or equal to 1000 MHz

2. All measurements were made at 3 meters. Harmonic 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 harmonic 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 and average detector are used for the emission over 1000MHz.

Test Engineer: Yvonne Leung

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WDE
Mode: Talk

Table 12, Desktop Unit

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit (dBµV/m)	Margin (dB)
V	82.952	33.8	16	6.7	24.5	40.0	-15.5
V	110.588	28.8	16	12.6	25.4	43.5	-18.1
V	124.406	30.0	16	12.8	26.8	43.5	-16.7
V	138.224	31.5	16	11.9	27.4	43.5	-16.1
V	152.042	32.2	16	11.9	28.1	43.5	-15.4
V	165.860	30.2	16	13.8	28.0	43.5	-15.5

NOTES: 1. Quasi-peak detector is used for the emission below or equal to 1000 MHz

2. All measurements were made at 3 meters. Harmonic 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 harmonic 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 and average detector are used for the emission over 1000MHz.

Test Engineer: Yvonne Leung

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WMC
Mode: Data Transfer

Table 13, Base Unit

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit (dBµV/m)	Margin (dB)
V	36.713	28.9	16	11.2	24.1	40.0	-15.9
V	37.862	30.5	16	11.2	25.7	40.0	-14.3
V	317.892	28.5	16	14.3	26.8	46.0	-19.2
V	345.417	29.4	16	14.6	28.0	46.0	-18.0
V	414.743	29.0	16	15.9	28.9	46.0	-17.1
V	442.316	28.4	16	16.3	28.7	46.0	-17.3

NOTES: 1. Quasi-peak detector is used for the emission below or equal to 1000 MHz

2. All measurements were made at 3 meters. Harmonic 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 harmonic 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 and average detector are used for the emission over 1000MHz.

Test Engineer: Yvonne Leung

Company: HKC Technology Ltd. Date of Test: December 22, 2003 to February 23, 2004
Model: WMC, WHE, WDE

4.22 Transmitter Duty Cycle Calculation and Measurements, FCC Rule 15.35(b), (c)

The EUT antenna output port was connected to the input of the spectrum analyzer. The analyzer center frequency was set to EUT RF channel carrier. The SWEEP function on the analyzer was set to ZERO SPAN. The transmitter ON time was determined from the resultant time-amplitude display:

Base Unit:

According to the TX duty cycle information provided by the client, it states that the worst-case of TX on time is 6 time slots in the same frequency.

Duty cycle (DC) = Maximum ON time in 10ms/10ms
= (0.3714ms x 6)/10ms for 6 handsets/ desktops units operation

Duty cycle correction, dB = 20* log (DC)
= 20* log (0.223)
= -13.0 dB

Handset and Desktop Unit:

Duty cycle (DC) = Maximum ON time in 10ms/10ms
= 0.3714ms/10ms

Duty cycle correction, dB = 20* log (DC)
= 20* log (0.037)
= -28.6 dB

X	See attached spectrum analyzer chart (s) for transmitter timing Base Unit: Plot B5, Handset: Plot H5, Desktop: Plot D5
	See transmitter timing diagram provided by manufacturer
	Not applicable, duty cycle was not used.

For electronic filing, the above plots are saved with filenames: bdcc.pdf, hdcc.pdf, ddcc.pdf

EXHIBIT 5
EQUIPMENT PHOTOGRAPHS

5.0 **Equipment Photographs**

For electronic filing, the photographs are saved with filename: external photos.doc, internal photos_base.doc, internal photos_handset.doc, and internal photos_desktop.doc

EXHIBIT 6
PRODUCT LABELLING

6.0 **Product Labelling**

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

EXHIBIT 7
TECHNICAL SPECIFICATIONS

7.0 **Technical Specifications**

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

EXHIBIT 8
INSTRUCTION MANUAL

8.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filenames: manual_base.pdf, manual_handset.pdf, and manual_desktop.pdf

Please note that the required FCC Information to the User is saved with filename: FCC information.pdf.

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

EXHIBIT 9
SECURITY CODE INFORMATION

9.0 Security code information

For electronic filing, the security code information is saved with filename: security code infromation.pdf