

Issuing Laboratory:
Intertek Testing Services Hong Kong Limited

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TEST REPORT

Report Number: 13081092HKG-002

Application
For

Class II Permissive Change of 47 CFR Part 15 Certification
Class I Permissive Change of RSS-213 Issue 2 Equipment Certification

Unlicensed Personal Communication Service Devices/
2 GHz License-exempt Personal Communications Service Devices

(Handset)

FCC ID: EW780-9046-00

IC: 1135B-80904600

Prepared and Checked by:

A handwritten signature in black ink, appearing to read 'Benny Lau', written over a horizontal line.

Lau Chin Yu, Benny
Lead Engineer

Approved by:

A handwritten signature in black ink, appearing to read 'Melvin Nip', written over a horizontal line.

Nip Ming Fung, Melvin
Assistant Manager
November 11, 2013

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Intertek Testing Services Hong Kong Ltd.

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GENERAL INFORMATION

VTech Telecommunications Ltd.:	VTech Telecommunications Ltd.
Applicant Address:	23/F, Tai Ping Industrial Centre, Block 1, 57 Ting Kok Road, Tai Po, Hong Kong.
FCC Specification Standard:	FCC Part 15, October 1, 2012 Edition
FCC ID:	EW780-9046-00
FCC Model(s):	EL51103, EL51203, EL51XY3
IC Specification Standard:	RSS-213 Issue 2, December 2005 RSS-Gen Issue 3, December 2010
IC:	1135B-80904600
IC Model(s):	EL51103, EL51203
Type of EUT:	Unlicensed Personal Communications Service Devices
Description of EUT:	1.9GHz Digital Modulation Cordless Phone with Caller ID and Speakerphone - Handset
Serial Number:	N/A
Sample Receipt Date:	August 27, 2013
Date of Test:	October 8, 2013
Report Date:	November 11, 2013
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%

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EXHIBIT 1
TEST RESULTS SUMMARY & STATEMENT OF COMPLIANCE

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1.0 Test Results Summary & Statement of Compliance

1.1 Summary of Test Results

General Technical Requirements					
Test Items	RSS-213 / RSS-Gen[#] Clause	FCC Part 15 Section	Test Procedure ANSI C63.17 / ANSI C63.4[*]	Results	Details see section
Emissions Outside the Sub-Band	6.7.1	15.323(d)	6.1.6.2	Pass	4.1

1.2 Statement of Compliance

The equipment under test is found to be complying with the following standards:

FCC Part 15, October 1, 2012 Edition
RSS-213 Issue 2, December 2005
RSS-Gen Issue 3, December 2010

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EXHIBIT 2
GENERAL DESCRIPTION

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2.0 General Description

2.1 Product Description

The EL51203 is a 1.9GHz Digital Modulation Cordless Phone with Caller ID and Speakerphone - Handset. It operates at frequency range of 1921.536MHz to 1928.448MHz with 5 channels (1921.536MHz, 1923.264MHz, 1924.992MHz, 1926.720MHz and 1928.448MHz). The EUT is powered by a “Ni-MH” type rechargeable battery pack (2.4V 300mAh).

The antenna used in handset is integral, and the test sample is a prototype.

For FCC, The Model(s): EL51103 and EL51XY3 are the same as the Model: EL51203 in electrical designs, including software & firmware, PCB layout and construction design/physical design/enclosure. The only differences between these models are color, model number, package type (material), number of handset and charger to be sold for marketing purpose. Suffix (X) indicates any alphanumeric character is presenting number of handset and charger. Suffix (Y) indicates 0, 1, 5, 6, 8 or 9 which presents different package type (material) or color of enclosure, or suffix (Y) indicates 2, 3, 4 or 7 which presents different package type (material) or color of enclosure model unit package with wireless speaker.

For IC, The Model(s): EL51103 is the same as the Model: EL51203 in electrical designs, including software & firmware, PCB layout and construction design/physical design/enclosure. The only differences between these models are color, model number, package type (material), number of handset and charger to be sold for marketing purpose.

2.2 Purpose of Application

The purpose of change is saved with filename: product change.pdf

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2.3 Test Methodology

The radiated emission measurements for unintentional radiator (if any) were performed according to the test procedures specified in ANSI C63.4 (2009). The radiated emission measurements for intentional radiator contained in UPCS device were performed according to the test procedures specified in ANSI C63.17 (2006). All radiated 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 47 CFR Part 2 / RSS-Gen Issue 3 (2010).

2.4 Test Facility

The open area test site used to collect the radiated data are at Rooftop of Intertek Testing Services Hong Kong Ltd., which 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 FCC and Industry Canada.

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EXHIBIT 3
SYSTEM TEST CONFIGURATION

3.0 System Test Configuration

3.1 Justification

For emissions testing, the equipment under test (EUT) was set up to transmit continuously in burst mode with pseudo-random data to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables (if any) were manipulated to produce worst-case emissions.

The EUT was powered by a “Ni-MH” type rechargeable battery pack (2.4V 300mAh).

For the measurements, the EUT was attached to a plastic stand if necessary and placed on the wooden turntable. If the EUT is attached to accessories, they were connected and operational (as typical as possible).

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

For UPCS transmitter radiated measurement, the spectrum analyzer resolution bandwidth was approximately 1% of EUT emission bandwidth, unless otherwise specified.

Radiated emission measurements for UPCS transmitter were performed from 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.

RF module and antenna for handset of EL51203 is the same with previous granted model EL52203. Therefore conducted emission measurement for EL51203 are skipped.

For IC, RF modules and antennas for handset of EL51203 is the same with previous granted model EL52203. Therefore conducted emission measurement for EL51203 are skipped.

3.2 EUT Exercising Software

The EUT exercise program (if any) 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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3.3 Details of EUT and Description of Accessories

Details of EUT:

A battery (provided with the unit) were used to power the device. Their descriptions are listed below.

- (1) A “Ni-MH” type rechargeable battery pack (2.4V 300mAh, Model: BT162342 / BT262342, Brand: GP) (Supplied by Client)
- (2) A “Ni-MH” type rechargeable battery pack (2.4V 300mAh, Model: BT162342 / BT262342, Brand: CORUN) (Supplied by Client)
- (3) A “Ni-MH” type rechargeable battery pack (2.4V 300mAh, Model: BT162342 / BT262342, Brand: Coslight) (Supplied by Client)
- (4) A “Ni-MH” type rechargeable battery pack (2.4V 300mAh, Model: BT162342 / BT262342, Brand: WEWIN) (Supplied by Client)
- (5) A “Ni-MH” type rechargeable battery pack (2.4V 300mAh, Model: BT162342 / BT262342, Brand: SANIK) (Supplied by Client)

Description of Accessories:

- (1) VTech Base Unit, Model: EL51203, FCC ID: EW780-9046-00 (Supplied by Client)

3.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of 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.

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EXHIBIT 4
TEST RESULTS

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4.0 Measurement Results

4.1 Emissions Outside the Sub-Band, FCC Rule 15.323(d) / RSS-213 Clause 6.7.1:

Emissions outside the sub-band shall be attenuated below a reference power of 112 mW (20.5 dBm) as follows:

1. 30 dB between the band edge and 1.25 MHz above or below the band;
2. 50 dB between 1.25 and 2.5 MHz above or below the band; and
3. 60 dB at 2.5 MHz or greater above or below the band, or shall meet the requirement of FCC Rule 15.319(g) which shall not exceed the limits of FCC Rule 15.209 / RSS-210 Clause 2.5.

Example: Calculation of Limit for emissions between the band edge and 1.25 MHz (1920.000 – 1918.750 MHz)

The emissions shall not exceed the Limit: 20.5 dBm – 30 dB = -9.5 dBm

Measurements are made in accordance with ANSI C63.17 sub-clause 6.1.6.2. Radiated emissions test method is used. Emissions that are directly caused by digital circuits in the transmit path and transmitter portion are measured.

Test Results:

Channel	Carrier Frequency (MHz)	Measured Band (MHz)	Limit (dBm)	Results
Lowest	1921.536	1920.000 - 1918.750	-9.5	Pass
		1918.750 - 1917.500	-29.5	Pass
		0.009 - 1917.500 & 1932.500 - 19300.000	-39.5 / RSS-210 Clause 2.5	Pass
Highest	1928.448	1930.000 - 1931.250	-9.5	Pass
		1931.250 - 1932.500	-29.5	Pass
		0.009 – 1917.500 & 1932.500 - 19300.000	-39.5 / RSS-210 Clause 2.5	Pass

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4.1.1 Radiated Emissions Configuration Photographs:

Worst Case Radiated Emission
at

3856.896 MHz

The worst case radiated emission configuration photographs are saved with filename: config photos.pdf

4.1.2 Radiated Emissions Data:

Data are 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 in table 1-3 list the significant emission frequencies, the limit and the margin of compliance.

Judgement:

Passed by 4.8 dB margin

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Mode: Transmission

Table 1

**Radiated Emissions Data
Pursuant To FCC Part 15 Section 15.323 (d) / RSS-213 Clause 6.7.1
Emissions Requirements**

Lowest Channel

Polarization	Frequency (MHz)	Measured Power (dBm)	Power Limit (dBm)	Margin (dB)
V	1919.850	-41.9	-9.5	-32.4
V	1917.869	-46.7	-29.5	-17.2
V	1917.101	-51.8	-39.5	-12.3
H	3843.072	-44.7	-39.5	-5.2
H	5764.608	-45.1	-39.5	-5.6
H	7686.144	-45.3	-39.5	-5.8
H	9607.680	-45.0	-39.5	-5.5
H	11529.216	-45.2	-39.5	-5.7

NOTES:

1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters.
3. Negative value in the margin column shows emission below limit.

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Mode: Transmission

Table 2

Radiated Emissions Data
Pursuant To FCC Part 15 Section 15.323 (d) / RSS-213 Clause 6.7.1
Emissions Requirements

Highest Channel

Polarization	Frequency (MHz)	Measured Power (dBm)	Power Limit (dBm)	Margin (dB)
V	1930.013	-42.3	-9.5	-32.8
V	1931.686	-46.6	-29.5	-17.1
V	1933.471	-52.7	-39.5	-13.2
H	3856.896	-44.3	-39.5	-4.8
H	5785.344	-44.9	-39.5	-5.4
H	7713.792	-45.0	-39.5	-5.5
H	9642.240	-45.1	-39.5	-5.6
H	11570.688	-45.3	-39.5	-5.8

NOTES:

1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters.
3. Negative value in the margin column shows emission below limit.

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Mode: Talk

Table 3

**Radiated Emissions Data
Pursuant To FCC Part 15 Section 15.323 (d) / RSS-213 Clause 6.7.1
Emissions Requirements**

Polarization	Frequency (MHz)	Measured Power (dBm)	Power Limit (dBm)	Margin (dB)
V	55.300	-63.6	-39.5	-24.1
V	110.600	-63.8	-39.5	-24.3
H	165.900	-62.8	-39.5	-23.3
H	221.200	-62.5	-39.5	-23.0
H	276.500	-63.0	-39.5	-23.5
H	331.800	-64.0	-39.5	-24.5

NOTES:

1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters.
3. Negative value in the margin column shows emission below limit.

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4.1.3 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 $\text{dB}\mu\text{V}/\text{m}$
- 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
- 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 $62.0 \text{ dB}\mu\text{V}$ is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29.0 dB is subtracted. The pulse desensitization factor of the spectrum analyzer is 0.0 dB , and the resultant average factor is -10.0 dB . The net field strength for comparison to the appropriate emission limit is $32.0 \text{ dB}\mu\text{V}/\text{m}$. This value in $\text{dB}\mu\text{V}/\text{m}$ is converted to its corresponding level in $\mu\text{V}/\text{m}$.

RA = $62.0 \text{ dB}\mu\text{V}$
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
PD = 0.0 dB
AV = -10 dB

$$FS = 62.0 + 7.4 + 1.6 - 29.0 + 0.0 + (-10.0) = 32.0 \text{ dB}\mu\text{V}/\text{m}$$

$$\text{Level in } \mu\text{V}/\text{m} = \text{Common Antilogarithm } [(32.0 \text{ dB}\mu\text{V}/\text{m})/20] = 39.8 \mu\text{V}/\text{m}$$

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4.1.4 Average Factor Calculation and Transmitter ON Time Measurements, FCC Rule 15.35(b, c) / RSS-Gen cl 4.5

[] 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 SPAN function on the analyzer was set to ZERO. The transmitter ON time was determined from the resultant time-amplitude display:

Please refer to the attached plots for more details:

The plots of Transmitter ON Time Measurements are saved as below.

[] Please refer to the attached transmitter timing diagram that are provided by manufacturer

[x] Not applicable - No average factor is required.

[] Please refer to Technical Description (descri.pdf) for more details

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**EXHIBIT 5
EQUIPMENT LIST**

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5.0 Equipment List

1) Radiated Emissions Test

Equipment	EMI Test Receiver	Spectrum Analyzer	Double Ridged Guide Antenna
Registration No.	EW-2500	EW-2188	EW-1015
Manufacturer	R&S	AGILENTTECH	EMCO
Model No.	ESCI	E4407B	3115
Calibration Date	Mar. 22, 2013	Nov. 5, 2012	Mar. 5, 2013
Calibration Due Date	Feb. 28, 2014	Nov. 5, 2013	Sep. 5, 2014

Equipment	Biconical Antenna	Log Periodic Antenna	Broad-Band Horn Antenna
Registration No.	EW-0954	EW-0447	EW-1679
Manufacturer	EMCO	EMCO	SCHWARZBECK
Model No.	3104C	3146	BBHA9170
Calibration Date	Apr. 30, 2013	Aug. 19, 2013	Apr. 1, 2013
Calibration Due Date	Oct. 30, 2014	Feb. 19, 2015	Apr. 1, 2014

Equipment	Biconical Antenna	Log Periodic Antenna	Spectrum Analyzer
Registration No.	EW-0571	EW-1042	EW-2253
Manufacturer	EMCO	EMCO	R&S
Model No.	3104C	3148	FSP40
Calibration Date	Apr. 5, 2012	Apr. 25, 2012	Apr. 24, 2013
Calibration Due Date	Oct. 5, 2013	Oct. 25, 2013	Apr. 24, 2014

END OF TEST REPORT