

VTech Telecommunications Ltd.

Application
For
Certification

900MHz/5.8GHz 30 Channel Analog Modulation Cordless Phone with
Caller ID and Digital Answering Machine - Base Unit

(FCC ID: EW780-6263-00)

HK08100726-1
KS/ ac
November 24, 2008

- The test report only allows to be revised within the retention period unless further standard or the requirement was noticed.
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LIST OF EXHIBITS

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MEASUREMENT/TECHNICAL REPORT

VTech Telecommunications Ltd. - Model: CS511Z-XY, CS512Z-XY

FCC ID: EW780-6263-00

This report concerns (check one:)		Original Grant <input checked="" type="checkbox"/>	Class II Change <input type="checkbox"/>
Equipment Type : <u>DXX – Pt 15 low Pwr Com. Device Tx</u>			
Deferred grant requested per 47 CFR 0.457(d)(1)(ii)?		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
		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 <input type="checkbox"/>	No <input checked="" type="checkbox"/>
If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [10-01-07 Edition] Provision.			
Report prepared by:	Sit Kim Wai, Ken Intertek Testing Services Hong Kong Ltd. 2/F., Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. Phone : 852-2173-8538 Fax: 852-2741-1693		

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List of attached file

Exhibit type	File Description	filename
Test Report	Test Report	report.pdf
Operational Description	Technical Description	descri.pdf
Test Setup Photos	Radiated & Conducted Emission for Base	config photos.pdf
Test Report	Emission Plot	emission.pdf
Test Report	Conducted Emission Test Result	conduct.pdf
External Photos	External Photo	external photos.pdf
Internal Photos	Internal Photo	internal photos.pdf
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
ID Label/Location Info	Label Artwork and Location	label.pdf
Users Manual	User Manual	CS5121 manual.pdf CS5111 manual.pdf
Cover Letter	Letter of Agency	letter of agency.pdf
Cover Letter	Confidentiality Request	request.pdf

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EXHIBIT 1 GENERAL DESCRIPTION

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1.0 General Description

1.1 Product Description

The Model: CS5121 is a 900MHz/5.8GHz 30 Channel Analog Modulation Cordless Phone with Caller ID and Digital Answering Machine – Base Unit, while the Model: CS5111 is a 900MHz/5.8GHz 30 Channel Analog Modulation Cordless Phone with Caller ID – Base Unit. Operating frequencies of Base Unit and Handset are from 912.750MHz-917.100MHz, and from 5857.200MHz-5865.900MHz respectively. Both base units of models CS5121 and CS5111 are powered by an AC adaptor 117VAC to 7.5VAC 350mA and 117VAC to 7.5VAC 200mA respectively. The unit is capable of either tone or pulse dialing. The circuit wiring are consistent under the requirement of part 68.

The antennas used in base unit is integral, and the tested sample is a prototype.

Two different kinds of base unit of models: CS5121 and CS5111 are one of the model series: CS512Z-XY and CS511Z-XY respectively. The letters “X” and “Y” are in term of any alphanumeric character or blank with different number of cordless handset and extra charger and different color of enclosure respectively, and the letter “Z” is in term of any alphanumeric character with different package material. The difference in model number serves as marketing strategy.

The circuit description is saved with filename: descri.pdf

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

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1.2 Related Submittal(s) Grants

This is an Application for Certification of a base unit of a cordless telephone system. Two transmitters are included in this Application. This specific report details the emission characteristics of each transmitter. The FCC ID of the associated handset is EW780-5735-05 and has been granted. A verification report has been prepared for the digital portion. The device is also subject to Part 68 Registration.

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 and conducted data are 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 (if any) 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. 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.

Measurements of the radiated signal level of the fundamental frequency component of the emission was performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.

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 Details of EUT and Description of Peripherals

Details of EUT:

An AC adaptor and/or a battery (provided with the unit) were used to power the device. Their description are listed below.

- (1) Base Unit for CS5121: An AC adaptor (117VAC to 7.5VAC 350mA, Model: UA075035E) (Supplied by Client)
- (2) Base Unit for CS5111: An AC adaptor (117VAC to 7.5VAC 200mA, Model: UA075020E) (Supplied by Client)

Description of Peripherals:

- (1) Handset: A "Ni-Cd" type rechargeable battery pack (3.6V 400mAh) (Supplied by Client)
- (2) Handset, Model: CS5121, FCC ID: EW780-5735-05 (Supplied by Client)
- (3) Telecommunication cable with RJ11C connectors (1m, unshielded), terminated (Supplied by Intertek)

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2.4 Measurement Uncertainty

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

2.5 Equipment Modification

Any modifications installed previous to testing by VTech Telecommunications Ltd. will be incorporated in each production model sold/leased in the United States.

No modifications were installed by Commercial & Electrical Division, Intertek Testing Services Hong Kong Ltd.

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

Confirmed by:

*Sit Kim Wai, Ken
Assistant Manager
Intertek Testing Services
Agent for VTech Telecommunications Ltd.*



Signature

November 24, 2008 Date

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**EXHIBIT 3
EMISSION RESULTS**

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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 dB μ V/m
 RA = Receiver Amplitude (including preamplifier) in dB μ 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 dB μ V/m
 RR = RA - AG in dB μ V
 LF = CF + AF in dB

Assume a receiver reading of 52.0 dB μ 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 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

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

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

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3.2 Radiated Emission Configuration Photograph - Base Unit

Worst Case Radiated Emission
at

for Model: CS5121 - 1825.500 MHz

for Model: CS5111 – 1834.200 MHz

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

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3.3 Radiated Emission Data - Base Unit

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

Judgement

for Model: CS5121 - Passed by 7.2 dB margin

for Model: CS5111 - Passed by 7.1 dB margin

TEST PERSONNEL:



Tester Signature

Jess Tang, Lead Engineer
Typed/Printed Name

November 24, 2008
Date

INTERTEK TESTING SERVICES

Company: VTech Telecommunications Ltd. Date of Test: October 30-November 11, 2008
Model: CS5121
Mode : TX-Channel 0

Table 1, Base unit

Radiated Emissions Pursuant to FCC Part 15 Section 15.249(a) Requirements

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
V	912.750	66.6	16	33.0	83.6	94.0	-10.4
V	1825.500	52.6	33	27.2	46.8	54.0	-7.2
V	*2738.250	47.8	33	30.4	45.2	54.0	-8.8
V	*3651.000	44.3	33	33.3	44.6	54.0	-9.4
V	*4563.750	42.0	33	34.9	43.9	54.0	-10.1
V	5476.500	40.5	33	35.7	43.2	54.0	-10.8
V	6389.250	38.7	33	36.9	42.6	54.0	-11.4

- 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: VTech Telecommunications Ltd. Date of Test: October 30-November 11, 2008
Model: CS5121
Mode : TX-Channel 29

Table 2, Base unit

Radiated Emissions Pursuant to FCC Part 15 Section 15.249(a) Requirements

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
V	917.100	66.8	16	33.0	83.8	94.0	-10.2
V	1834.200	52.2	33	27.2	46.4	54.0	-7.6
V	*2751.300	48.4	33	30.4	45.8	54.0	-8.2
V	*3668.400	44.6	33	33.3	44.9	54.0	-9.1
V	*4585.500	41.7	33	34.9	43.6	54.0	-10.4
V	5502.600	39.8	33	36.6	43.4	54.0	-10.6
V	6419.700	38.6	33	36.9	42.5	54.0	-11.5

- 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: VTech Telecommunications Ltd. Date of Test: October 30-November 11, 2008
Model: CS5111
Mode : TX-Channel 0

Table 3, Base unit

Radiated Emissions Pursuant to FCC Part 15 Section 15.249(a) Requirements

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
V	912.750	68.6	16	33.0	85.6	94.0	-8.4
V	1825.500	52.2	33	27.2	46.4	54.0	-7.6
V	*2738.250	47.9	33	30.4	45.3	54.0	-8.7
V	*3651.000	44.9	33	33.3	45.2	54.0	-8.8
V	*4563.750	43.0	33	34.9	44.9	54.0	-9.1
V	5476.500	40.9	33	35.7	43.6	54.0	-10.4
V	6389.250	39.3	33	36.9	43.2	54.0	-10.8

- 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: VTech Telecommunications Ltd. Date of Test: October 30-November 11, 2008
Model: CS5111
Mode : TX-Channel 29

Table 4, Base unit

Radiated Emissions Pursuant to FCC Part 15 Section 15.249(a) Requirements

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
V	917.100	67.8	16	33.0	84.8	94.0	-9.2
V	1834.200	52.7	33	27.2	46.9	54.0	-7.1
V	*2751.300	48.0	33	30.4	45.4	54.0	-8.6
V	*3668.400	45.0	33	33.3	45.3	54.0	-8.7
V	*4585.500	42.7	33	34.9	44.6	54.0	-9.4
V	5502.600	40.2	33	36.6	43.8	54.0	-10.2
V	6419.700	39.5	33	36.9	43.4	54.0	-10.6

- 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

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3.4 Radiated Emission on the Bandedge

From the following plots, they show that the fundamental emissions are confined in the specified band (902MHz and 928MHz). 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:

Model: CS5121

Plot B1A1: Base Unit - Low Channel Emissions

Plot B1B1: Base Unit - High Channel Emissions

Model: CS5111

Plot B1A2: Base Unit - Low Channel Emissions

Plot B1B2: Base Unit - High Channel Emissions

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

Pursuant to FCC Part 15 Section 15.215(c), the 20dB bandwidth of the emission was contained within the frequency band designated (mentioned as above) which the EUT operated. The effects, if any, from frequency sweeping, frequency hopping, other modulation techniques and frequency stability over expected variations in temperature and supply voltage were considered.

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3.5 Line Conducted Configuration Photograph - Base Unit

Worst Case Line-Conducted Configuration

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

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3.6 Line Conducted Emission Data

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

Judgement

for Models: CS5121 and CS5111 - Passed by more than 20 dB margin

TEST PERSONNEL:



Tester Signature

Jess Tang, Lead Engineer
Typed/Printed Name

November 24, 2008
Date

INTERTEK TESTING SERVICES

Company: VTech Telecommunications Ltd. Date of Test: October 30-November 11, 2008
Model: CS5121, CS5111

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.pdf & internal photos.pdf

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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**

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6.0 Technical Specifications

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

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**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: CS5121 manual.pdf & CS5111 manual.pdf

The required FCC Information to the User is stated on 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
LETTER OF AGENCY**

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8.0 Letter of Agency

For electronic filing, a letter of agency is saved with filename: letter of agency.pdf

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**EXHIBIT 9
CONFIDENTIALITY REQUEST**

INTERTEK TESTING SERVICES

9.0 Confidentiality Request

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