

CCT R&D Ltd.

Application
For
Certification
(FCC ID: NC8SD7505)

5.8GHz Frequency Hopping Spread Spectrum Cell Dock with Bluetooth

0609840
KL/ Ann Choy
August 29, 2006

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LIST OF EXHIBITS

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MEASUREMENT/TECHNICAL REPORT

CCT R&D Ltd. - MODEL: SD7505

FCC ID: NC8SD7505

August 29, 2006

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

Equipment Type: DXT - 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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List of attached file

Exhibit type	File Description	filename
Test Report	Test Report	report.pdf
Cover Page	Confidentiality Request	request.pdf
Operation Description	Technical Description	descri.pdf
Test Setup Photo	Radiated Emission	config photos.doc
Test Setup Photo	Conducted Emission	config photos.doc
Test Report	Conducted Emission Test Result	conduct.pdf
Test Report	Emission Plot	emission.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 SD7505 is a cell dock which is an accessory of a 5.8GHz Frequency Hopping Spread Spectrum Cordless Phone with Caller ID. It operates at frequency range of 2402MHz-2480MHz for communicating with a Bluetooth-equipped mobile device. On the other hand, it has another RF module that operates at frequency range of 5725.809MHz-5848.889MHz.

With Bluetooth and 5.8GHz wireless communications enable, the cell dock allows a user uses a cordless handset to dial out or receive cellular phone calls via the cellular network. It has a "Bluetooth" button that manages Bluetooth connections to a Bluetooth-equipped mobile device, and it also has a "Registration" button on the bottom to register itself to a base unit of 5.8GHz cordless phone. Besides, connecting with a Motorola compatible cellular phone, it is a cradle and is used for downloading phonebook data and charging the cellular phone only.

Antenna Type : Integral, Internal

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

1.2 Related Submittal(s) Grants

This is an application for certification of a transmitter. One transmitter is included in this application. The device is also subject to Part 68 Registration. On the other hand, a 5.8GHz transmitter, a composite device subject to an additional equipment authorization, has the same as this FCC ID: NC8SD7505 and has been filed at the same time.

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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 emission 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 cell dock was powered by an AC adaptor.

For the measurements, the EUT is attached to a plastic stand if necessary and placed on the wooden turntable. If the cell dock unit attaches to peripherals, they are connected and operational (as typical as possible). The base unit and the handset are remotely located as far from the antenna and the cell dock as possible to ensure full power transmission from the cell dock. Else, the cell dock 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 (Toshiba HCI Tester2) 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 (included inserted cards, which have grants) are:

HARDWARE:

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

- (1) An AC adaptor (120VAC to 9VDC 700mA, Model: DU41090070C)

CABLES:

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

OTHERS:

- (1) A 5.8GHz FHSS Cordless Phone with Caller ID, Speakerphone, and Digital Answering Machine, Model: SD7581, S/N: 718VGE02B4, FCC ID: NC8SD7581 (Supplied by Client)
- (2) Cellular Phone, Model: Motorola V66 GPRS, CMII ID: 2001CP0157 (Supplied by Client)

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2.4 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.

2.5 Equipment Modification

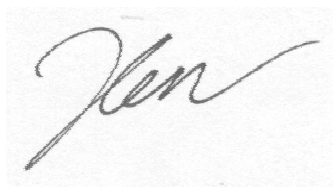
Any modifications installed previous to testing by CCT R&D Ltd. will be incorporated in each production model sold/leased in the United States.

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

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

Confirmed by:

*Lam Chun Cheong, Kenneth
Senior Lead Engineer
Intertek Testing Services Hong Kong Ltd.
Agent for CCT R&D Ltd.*



Signature

August 29, 2006 Date

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EXHIBIT 3

EMISSION RESULTS

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3.0 **Emission Results**

Data is included 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 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 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

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 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. 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 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

$$RA = 62.0 \text{ dB}\mu\text{V}$$

$$AF = 7.4 \text{ dB}$$

$$CF = 1.6 \text{ dB}$$

$$AG = 29.0 \text{ dB}$$

$$PD = 0 \text{ dB}$$

$$AV = -10 \text{ dB}$$

$$FS = 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32 \text{ dB}\mu\text{V/m}$$

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

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3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission
at
3603.000 MHz

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

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3.3 Radiated Emission Data

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgement: Passed by 1.6 dB

TEST PERSONNEL:



Signature

Jess Tang, Lead Engineer
Typed/Printed Name

August 29, 2006
Date

INTERTEK TESTING SERVICES

Company: CCT R&D Ltd.
Model: SD7505
Mode: TX

Date of Test: May 19-July 14, 2006

Table 1

Radiated Emissions Peak Data at Fundamental Frequency

Channel	Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m-Peak (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
0	V	2402.000	99.0	33	29.4	95.4	114.0	-18.6
39	V	2441.000	100.7	33	29.4	97.1	114.0	-16.9
78	V	2480.000	100.6	33	29.4	97.0	114.0	-17.0

Table 2

Radiated Emissions Average Data at Fundamental Frequency

Channel	Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m-Average (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
0	V	2402.000	89.5	33	29.4	85.9	94.0	-8.1
39	V	2441.000	91.8	33	29.4	88.2	94.0	-5.8
78	V	2480.000	90.6	33	29.4	87.0	94.0	-7.0

- Notes:
1. In table 1, peak detector is used for the emission measurement.
 2. In table 2, average detector is used for the emission measurement.
 3. All measurements were made at 3 meter.
 4. Negative value in the margin column shows emission below limit.
 5. Horn antenna is used for emission over 1000MHz.

Test Engineer: Jess Tang

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Company: CCT R&D Ltd.
Model: SD7505
Mode: TX - Channel 0

Date of Test: May 19-July 14, 2006

Table 3

Radiated Emissions

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)
H	800.667	25.0	16	31.0	40.0	46.0	-6.0
V	*1201.000	47.5	33	26.1	40.6	54.0	-13.4
V	*3603.000	52.1	33	33.3	52.4	54.0	-1.6
H	*4804.000	45.9	33	34.9	47.8	54.0	-6.2
H	6005.000	39.5	33	36.9	43.4	54.0	-10.6
H	7206.000	38.3	33	37.9	43.2	54.0	-10.8
H	9608.000	35.4	33	40.4	42.8	54.0	-11.2

- Notes:
1. Peak detector is used for the emission measurement.
 2. All measurements were made at 3 meter. 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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Company: CCT R&D Ltd.
Model: SD7505
Mode: TX - Channel 39

Date of Test: May 19-July 14, 2006

Table 4

Radiated Emissions

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)
H	813.667	25.2	16	31.0	40.2	46.0	-5.8
V	*1220.500	49.7	33	26.1	42.8	54.0	-11.2
V	*3661.500	51.8	33	33.3	52.1	54.0	-1.9
H	*4882.000	45.0	33	34.9	46.9	54.0	-7.1
H	6102.500	41.3	33	36.9	45.2	54.0	-8.8
H	*7323.000	39.7	33	37.9	44.6	54.0	-9.4
H	9764.000	36.0	33	40.4	43.4	54.0	-10.6

- Notes:
1. Peak detector is used for the emission measurement.
 2. All measurements were made at 3 meter. 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 fulfil the requirement of Section 15.209.

Test Engineer: Jess Tang

INTERTEK TESTING SERVICES

Company: CCT R&D Ltd.
Model: SD7505
Mode: TX - Channel 78

Date of Test: May 19-July 14, 2006

Table 5

Radiated Emissions

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)
H	826.667	25.2	16	31.0	40.2	46.0	-5.8
V	*1240.000	48.7	33	26.1	41.8	54.0	-12.2
V	*3720.000	51.5	33	33.3	51.8	54.0	-2.2
H	*4960.000	45.7	33	34.9	47.6	54.0	-6.4
H	6200.000	41.5	33	36.9	45.4	54.0	-8.6
H	*7440.000	39.7	33	37.9	44.6	54.0	-9.4
H	9920.000	36.5	33	40.4	43.9	54.0	-10.1

- Notes:
1. Peak detector is used for the emission measurement.
 2. All measurements were made at 3 meter. 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 fulfil the requirement of Section 15.209.

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 (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 D1A*: Low Channel Emissions

Plot D1B: High Channel Emissions

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

* Bandedge compliance is determined by applying market-delta method, i.e.

Resultant field strength in peak value

= Fundamental emission with peak detector - delta from the plot

= 95.4dB μ V/m - 45.14dB

= 50.26dB μ V/m

Resultant field strength in average value

= Fundamental emission with average detector - delta from the plot

= 85.9dB μ V/m - 45.14dB

= 40.76dB μ V/m

The resultant field strength meets the general radiated emission limit in section 15.209, which does not exceed 54dB μ V/m in average or 74dB μ V/m in peak.

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3.5 Conducted Emission Configuration Photograph

Worst Case Line-Conducted Configuration

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

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3.6 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 20 dB

For electronic filing, the graph and data table of conducted emission is saved with filename: conduct.pdf.

TEST PERSONNEL:



Signature

Jess Tang, Lead Engineer
Typed/Printed Name

August 29, 2006
Date

INTERTEK TESTING SERVICES

Company: CCT R&D Ltd.
Model: SD7505

Date of Test: May 19-July 14, 2006

3.7 Radiated Emissions from Digital Portion of EUT, FCC Ref: 15.109

☐ Not required - No digital part

☒ Test results are attached

☐ Included in the separated DOC report.

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Company: CCT R&D Ltd.
Model: SD7505
Mode: TX

Date of Test: May 19-July 14, 2006

Table 6

Radiated Emissions

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	34.828	35.6	16	10.0	29.6	40.0	-10.4
V	43.086	35.4	16	10.0	29.4	40.0	-10.6
V	51.208	33.5	16	11.0	28.5	40.0	-11.5
V	59.674	34.2	16	10.0	28.2	40.0	-11.8
H	231.629	25.4	16	18.0	27.4	46.0	-18.6
H	239.674	24.2	16	19.0	27.2	46.0	-18.8
H	247.692	22.8	16	20.0	26.8	46.0	-19.2
H	255.866	21.2	16	21.0	26.2	46.0	-19.8

- Notes:
1. Quasi-peak detector is used for the emission below or equal to 1000MHz.
 2. All measurements were made at 3 meter. 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.

Test Engineer: Jess Tang

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EXHIBIT 4

EQUIPMENT PHOTOGRAPHS

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4.0 Equipment Photographs

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

EXHIBIT 5
PRODUCT LABELLING

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5.0 **Product Labelling**

For electronic filing, the FCC ID label artwork and the label location are 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 schematics of the tested EUT 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: manual.pdf.

Please note that the required FCC Information to the User is on page iii 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

INTERTEK TESTING SERVICES

8.0 Confidentiality Request

For electronic filing, the confidentiality request is saved with filename: request.pdf