



SDI Technologies Inc.

Application
For
Certification
(FCC ID: EMOIP47)

Transceiver

HK08011045-2
TC/el
March 12, 2008

- The test report only allows to be revised within three years from its original issued date unless further standard or the requirement was noticed.
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LIST OF EXHIBITS

INTRODUCTION

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

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MEASUREMENT / TECHNICAL REPORT

SDI Technologies Inc.

MODEL: iHome iP47X ('X' denoted as the color of the cabinet)

FCC ID: EMOIP47

March 12, 2008

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

Equipment Type: DXT - Part 15 Low Power Transceiver, Receiver Verified (example: computer, printer, modem, etc.)

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

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 ☒

If no, assumed Part 15, Subpart C for intentional radiator – the new 47 CFR [05-04-07 Edition] provision.

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Table of Contents

1.0	<u>General Description</u>	2
1.1	Product Description	2
1.2	Related Submittal(s) Grants	2
1.3	Test Methodology	3
1.4	Test Facility	3
2.0	<u>System Test Configuration</u>	5
2.1	Justification	5
2.2	EUT Exercising Software	5
2.3	Special Accessories	5
2.4	Equipment Modification	6
2.5	Measurement Uncertainty	6
2.6	Support Equipment List and Description	6
3.0	<u>Emission Results</u>	8
3.1	Field Strength Calculation	9
3.2	Radiated Emission Configuration Photograph	11
3.3	Radiated Emission Data	12
3.4	Conducted Emission Configuration Photograph	15
3.5	Conducted Emission Data	16
4.0	<u>Equipment Photographs</u>	18
5.0	<u>Product Labelling</u>	20
6.0	<u>Technical Specifications</u>	22
7.0	<u>Instruction Manual</u>	24
8.0	<u>Miscellaneous Information</u>	26
8.1	Bandedge Plot	27
8.2	Discussion of Pulse Desensitization	28
8.3	Emissions Test Procedures	29

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List of attached file

Exhibit Type	File Description	Filename
Cover Letter	Letter of Agency	letter.pdf
Test Report	Test Report	report.pdf
Operation Description	Technical Description	descri.pdf
Test Setup Photo	Radiated Emission	radiated photos.pdf
Test Setup Photo	Conducted Emission	conducted photos.pdf
Test Report	Conducted Emission Test Result	conducted.pdf
Test Report	Bandedge Plot	be.pdf
External Photo	External Photo	external photos.pdf
Internal Photo	Internal Photo	internal photos.pdf
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
ID Label / Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf

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EXHIBIT 1

GENERAL DESCRIPTION

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1.0 **General Description**

1.1 Product Description

The Equipment Under Test (EUT) is a Bluetooth Alarm Clock Radio for iPhone/iPod, the Transceiver part (i.e. Bluetooth) operating at 2402 - 2480MHz. The EUT is powered by an AC/DC adaptor (Model: KU57-120-1800D, Input 120VAC 60Hz, Output 12VDC 800mA). For the Bluetooth portion, it can play music through Bluetooth from your mobile phone or computer. It can also provide hand free function for your mobile phone via Bluetooth.

An iPhone/iPod docking on the top of the unit is used for connect your iPhone/iPod. All the control buttons are on the front panel, two selection buttons on the left hand side of the unit is used to select desire function, four selection buttons on the right hand side of the unit is used to volume up/down set, another two buttons is used for Talk and End of the call during hand free function. There is six selection buttons on the upper side of the front panel is used to Alarm Clock and Radio setting, A power on, play and mode buttons are used for Power On/Off, Play/Pause and Mode Selection respectively. An Alpha-Numeric Phone Keypad at the bottom of the unit is used for making call with Bluetooth mobile phone.

Antenna Type: Internal, Integral

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

1.2 Related Submittal(s) Grants

This is a single application for certification of a Transmitter.

The receiver portion associated with this transmitter is exempted from technical requirement of this part.

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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). Radiated Emission measurement was performed in Open Area Test Sites and Conducted Emission was performed in Shield Room. Preliminary scans were performed in the Open Area Test Sites only to determine worst case modes. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

1.4 Test Facility

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

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EXHIBIT 2

SYSTEM TEST CONFIGURATION

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2.0 **System Test Configuration**

2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.4 (2003).

The EUT was powered by an AC/DC adaptor (model: KU57-120-1800D, input: 120VAC, output: 12VDC/800mA).

For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. The step by step procedure for maximizing emissions led to the data reported in Exhibit 3.0.

The rear of unit shall be flushed with the rear of the table.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was placed on turntable, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

2.2 EUT Exercising Software

There was no special software to exercise the device. Once the unit is powered up, it transmits the RF signal continuously.

2.3 Special Accessories

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

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2.4 Equipment Modification

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

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

2.5 Measurement Uncertainty

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

2.6 Support Equipment List and Description

Agilent E1852A Bluetooth Test Set
iPod Video (EW-2402)
Auxiliary input - Cassette Player
AM antenna

All the items listed under section 2.0 of this report are

Confirmed by:

*Ho Wai Kin, Ben
Senior Supervisor
Intertek Testing Services Hong Kong Ltd.
Agent for SDI Technologies Inc.*



Signature

March 12, 2008 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:

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

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3.1 Field Strength Calculation (cont'd)

Example

Assume a receiver reading of 62.0dB μ V is obtained. The antenna factor of 7.4dB and cable factor of 1.6dB is added. The amplifier gain of 29dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0dB, and the resultant average factor was -10dB. The net field strength for comparison to the appropriate emission limit is 32dB 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
2480MHz

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

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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 0.2dB margin

TEST PERSONNEL:



Signature

Terry C. H. Chan, Compliance Engineer
Typed / Printed Name

March 12, 2008
Date

INTERTEK TESTING SERVICES

Company: SDI Technologies Inc.

Date of Test: March 10, 2008

Model: iHome iP47X

Worst Case Operating Mode: Transmitting (Dut Mode)

Table

Radiated Emissions

Channel 00

Polarization	Frequency	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Calculated at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
H	2402.000	95.6	33	29.4	92.0	94.0	-2.0
H	4804.000	45.1	33	34.9	47.0	54.0	-7.0
H	7206.000	41.1	33	37.9	46.0	54.0	-8.0
H	9608.000	37.9	33	40.4	45.3	54.0	-8.7
H	12010.000	37.4	33	40.5	44.9	54.0	-9.1

Channel 40

Polarization	Frequency	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Calculated at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
H	2442.000	97.3	33	29.4	93.7	94.0	-0.3
H	4884.000	45.7	33	34.9	47.6	54.0	-6.4
H	7326.000	41.4	33	37.9	46.3	54.0	-7.7
H	9768.000	38.3	33	40.4	45.7	54.0	-8.3
H	12210.000	37.3	33	40.5	44.8	54.0	-9.2

NOTES: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances 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 is used for the emission over 1000MHz.

Test Engineer: Terry C. H. Chan

INTERTEK TESTING SERVICES

Company: SDI Technologies Inc.

Date of Test: March 10, 2008

Model: iHome iP47X

Worst Case Operating Mode: Transmitting (Dut Mode)

Table

Radiated Emissions

Channel 78

Polarization	Frequency	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Calculated at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	2480.000	97.4	33	29.4	93.8	94.0	-0.2
H	4960.000	45.9	33	34.9	47.8	54.0	-6.2
H	7440.000	42.0	33	37.9	46.9	54.0	-7.1
H	9920.000	39.1	33	40.4	46.5	54.0	-7.5
H	12400.000	37.5	33	40.5	45.0	54.0	-9.0

NOTES: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances 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 is used for the emission over 1000MHz.

Test Engineer: Terry C. H. Chan

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3.4 Conducted Emission Configuration Photograph

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

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3.5 Conducted Emission Data

For electronic filing, the graph and data table of conducted emission are saved with filename: conducted.pdf. The data table lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgement: Passed by >20dB margin

TEST PERSONNEL:



Signature

Terry C. H. Chan, Compliance Engineer
Typed / Printed Name

March 12, 2008
Date

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EXHIBIT 4

EQUIPMENT PHOTOGRAPHS

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4.0 **Equipment Photographs**

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

EXHIBIT 5
PRODUCT LABELLING

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5.0 **Product Labelling**

For electronics 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 schematic of the tested EUT are saved with filename: block.pdf and circuit.pdf respectively.

EXHIBIT 7
INSTRUCTION MANUAL

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7.0 **Instruction Manual**

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

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

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EXHIBIT 8

MISCELLANEOUS INFORMATION

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8.0 **Miscellaneous Information**

The miscellaneous information includes details of the measured bandwidth test procedure and calculation of factor such as pulse desensitization.

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8.1 Bandedge Plot

For electronic filing, the plot shows the fundamental emission when modulated is saved with filename: be.pdf. From the plot, the field strength of any emissions outside of the specified frequency band are attenuated to the general radiated emission limits in Section 15.209. It fulfil the requirement of 15.249(d).

Peak Measurement

Bandedge compliance is determined by applying marker-delta method, i.e (Bandedge Plot).

Resultant field strength = Fundamental emissions (peak value) - delta from the bandedge plot

$$= 92.0\text{dB}\mu\text{V/m} - 42.66\text{dB}$$

$$= 49.34\text{dB}\mu\text{V/m}$$

Resultant field strength = Fundamental emissions (peak value) - delta from the bandedge plot

$$= 93.8\text{dB}\mu\text{V/m} - 46.17\text{dB}$$

$$= 47.63\text{dB}\mu\text{V/m}$$

The resultant field strength meets the general radiated emission limit in section 15.209, which does not exceed 74dBμV/m (Peak Limit) and 54dBμV/m (Average Limit).

8.2 Discussion of Pulse Desensitization

Pulse desensitivity is not applicable for this device. The effective period (T_{eff}) is approximately 210 μ s for a digital “1” bit which illustrated on technical specification, with a resolution bandwidth (3dB) of 1MHz, so the pulse desensitivity factor is 0dB.

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8.3 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services Hong Kong Ltd. in the measurements of transmitters operating under Part 15, Subpart C rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.4 – 2003.

The transmitting equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately one meter in height above the ground plane. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The EUT is adjusted through all three orthogonal axes to obtain maximum emission levels. The antenna height and polarization are varied during the testing to search for maximum signal levels. The height of the antenna is varied from one to four meters.

Detector function for radiated emissions is in peak mode. Average readings, when required, are taken by measuring the duty cycle of the equipment under test and subtracting the corresponding amount in dB from the measured peak readings. A detailed description for the calculation of the average factor can be found in Exhibit 8.3.

The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9kHz to the tenth harmonic of the highest fundamental frequency or 40GHz, whichever is lower. For line-conducted emissions, the range scanned is 150kHz to 30MHz.

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8.3 Emissions Test Procedures (cont'd)

The EUT is warmed up for 15 minutes prior to the test.

AC power to the unit is varied from 85% to 115% nominal and variation in the fundamental emission field strength is recorded. If battery powered, a new, fully charged battery is used.

Conducted measurements are made as described in ANSI C63.4 – 2003.

The IF bandwidth used for measurement of radiated signal strength was 100kHz or greater when frequency is below 1000MHz. Where pulsed transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2. A discussion of whether pulse desensitivity is applicable to this unit is included in this report (See Exhibit 8.2). Above 1000MHz, a resolution bandwidth of 1MHz is used.

Transmitter measurements are normally conducted at a measurement distance of three meters. However, to assure low enough noise floor in the forbidden bands and above 1GHz, signals are acquired at a distance of one meter or less. All measurements are extrapolated to three meters using inverse scaling, unless otherwise reported. Measurements taken at a closer distance are so marked.