Sound Innovation Development Limited

Application
For
Certification
(FCC ID: U7J-BKWMSIPOD-RX)

Superheterodyne Receiver

07046444
TC/el
June 29, 2007

Intertek Testing Services Hong Kong Ltd.
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LIST OF EXHIBITS

MEASUREMENT / TECHNICAL REPORT

Sound Innovation Development Limited – MODEL: BROOKSTONE BL647

FCC ID: U7J-BKWMSIPOD-RX

June 29, 2007

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

Equipment Type: Superheterodyne Receiver (example: computer, printer, modem, etc.)

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 B for unintentional radiator – the new 47 CFR [04-05-05 Edition] provision.

Report prepared by:

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Exhibit Type	File Description	Filename
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
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

EXHIBIT 1

GENERAL DESCRIPTION

1.0 General Description

1.1 Product Description

The Equipment Under Test (EUT) is a 900MHz audio wireless speaker system with left (L) and right (R) channel for it associated transmitter. The main function of the EUT is used to receive the modulated signal that can be transmitting by its associated transmitter. There are three different channels available, Channel 1, Channel 2 and Channel 3 and the frequencies are L892.7/R915.9, L891.9/R915.1 and L893.5/R916.7MHz respectively. It can be powered by a rechargeable battery (Model: HKG1600AAE5WMX) or an AC/DC adaptor (Model: KSS12-090-1000U, Input: 100-240V, Output: DC 9V 1000mA). The ogran LED on the top of the EUT's body will be lighted while power on. And, there have two buttons for volume control. A channel switch that is located inside the plastic case next to the battery compartment is used for channel select.

Antenna Type: Internal, Integral

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

1.2 Related Submittal(s) Grants

The Certification procedure of transmitter for this receiver (with FCC ID: U7J-BKWMSIPOD-TX) is being processed as the same time of this application.

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. For each scan, the procedure for maximizing emissions in Appendices D and E were followed. 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.

EXHIBIT 2

SYSTEM TEST CONFIGURATION

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: KSS12-090-1000U, Input: 100-240V, Output: 9V 1000mA).

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.

For simplicity of testing, the unit was operated to receive continuously.

2.2 EUT Exercising Software

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

2.3 Special Accessories

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

2.4 Equipment Modification

Any modifications installed previous to testing by Sound Innovation Development Limited 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.

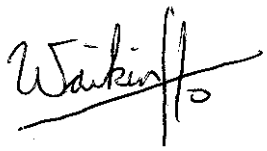
2.6 Support Equipment List and Description

Associated Transmitter (FCC ID: U7J-BKWMSIPOD-TX)

All the items listed under section 2.0 of this report are

Confirmed by:

Ho Wai Kin, Ben
Supervisor
Intertek Testing Services Hong Kong Ltd.
Agent for Sound Innovation Development Limited



Signature

June 29, 2007 *Date*

EXHIBIT 3

EMISSION RESULTS

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.

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 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:

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

3.1 Field Strength Calculation (cont'd)

Example

Assume a receiver reading of 62.0dBμV 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 32dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 62.0dBμV
AF = 7.4dB
CF = 1.6dB
AG = 29.0dB
PD = 0dB

AV = −10dB

FS = 62 + 7.4 + 1.6 − 29 + 0 + (−10) = 32dBμV/m

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

3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission
at
2745.309MHz

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

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 6.10dB margin

TEST PERSONNEL:

Signature

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

June 29, 2007
Date

Company: Sound Innovation Development Limited Date of Test: May 15, 2007
Model: BROOKSTONE BL647
Worst Case Operating Mode: Receiving L Speaker (Channel 02)

Table 1

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
V	891.905	21.0	16	32.0	37.0	46.0	-9.0
H	1783.810	46.9	33	27.2	41.1	54.0	-12.9
H	2675.715	48.7	33	30.4	46.1	54.0	-7.9
H	3567.620	44.5	33	33.3	44.8	54.0	-9.2
H	4459.525	42.5	33	34.8	44.3	54.0	-9.7

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

Company: Sound Innovation Development Limited Date of Test: May 15, 2007
Model: BROOKSTONE BL647
Worst Case Operating Mode: Receiving L Speaker (Channel 03)

Table 2

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
V	893.505	20.8	16	32.0	36.8	46.0	-9.2
H	1787.010	47.3	33	27.2	41.5	54.0	-12.5
H	2680.515	48.8	33	30.4	46.2	54.0	-7.8
H	3574.020	44.4	33	33.3	44.7	54.0	-9.3
H	4467.525	42.6	33	34.8	44.4	54.0	-9.6

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

Company: Sound Innovation Development Limited Date of Test: May 15, 2007
Model: BROOKSTONE BL647
Worst Case Operating Mode: Receiving R Speaker (Channel 02)

Table 3

Radiated Emissions

Polarization	Frequency (MHz)	Net at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
V	915.103	37.4	46.0	-8.6
H	1830.206	42.1	54.0	-11.9
H	2745.309	47.9	54.0	-6.1
H	3660.412	44.2	54.0	-9.8
H	4575.515	43.2	54.0	-10.8
H	5490.618	40.2	54.0	-13.8

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

Company: Sound Innovation Development Limited Date of Test: May 15, 2007
Model: BROOKSTONE BL647
Worst Case Operating Mode: Receiving R Speaker (Channel 03)

Table 4

Radiated Emissions

Polarization	Frequency (MHz)	Net at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
V	916.702	37.6	46.0	-8.4
H	1833.404	42.0	54.0	-12.0
H	2750.106	47.2	54.0	-6.8
H	3666.808	43.4	54.0	-10.6
H	4583.510	42.6	54.0	-11.4
H	5500.212	40.3	54.0	-13.7

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

Company: Sound Innovation Development Limited Date of Test: May 15, 2007
Model: BROOKSTONE BL647
Worst Case Operating Mode: Charging

Table 5

Radiated Emissions

Polarization	Frequency (MHz)	Net at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
V	35.750	29.6	40.0	-10.4
V	39.176	30.4	40.0	-9.6
V	42.375	30.3	40.0	-9.7
V	47.625	29.8	40.0	-10.2
V	53.870	29.0	40.0	-11.0
V	61.110	28.8	40.0	-11.2

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

3.4 Conducted Emission Configuration Photograph

Worst Case Line-Conducted Emission
at
0.186MHz

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

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 12.80dB margin

TEST PERSONNEL:

Signature

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

June 29, 2007
Date

EXHIBIT 4

EQUIPMENT PHOTOGRAPHS

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

5.0 **Product Labelling**

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

EXHIBIT 6

TECHNICAL SPECIFICATIONS

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

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.

EXHIBIT 8

MISCELLANEOUS INFORMATION

8.0 **Miscellaneous Information**

The miscellaneous information includes details of the test procedure.

8.1 Discussion of Pulse Desensitization

This device is a superheterodyne receiver. No desensitization of the measurement equipment is required as the received signals are continuously.

8.2 Calculation of Average Factor

This device is a superheterodyne receiver. It is not necessary to apply average factor to the measurement result.

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 superheterodyne receivers operating under Part 15, Subpart B rules.

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

The 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.

The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9kHz to 5000MHz. For line-conducted emissions, the range scanned is 150kHz to 30MHz.

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.

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 of less. All measurements are extrapolated to three meters using inverse scaling, unless otherwise reported. Measurements taken at a closer distance are so marked.