Tomoe Electronics Co.

Application
For
Certification
(FCC ID: S6LBROOKSTONE)

Superheterodyne Receiver

05052772
TC/el
May 26, 2005

FCC ID: S6LBROOKSTONE

Intertek Testing Services Hong Kong Ltd.
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LIST OF EXHIBITS

MEASUREMENT/TECHNICAL REPORT

Tomoe Electronics Co. - MODEL: OUTDOOR WIRELESS SPEAKER BROOKSTONE
FCC ID: S6LBROOKSTONE

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 [12-08-03 Edition] provision.

Report prepared by:

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Test Report	Conducted Emission Test Result	Conduct.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

This Equipment Under Test (EUT) is an audio wireless receiver for it corresponding transmitter. The main function of the EUT is used to receive the modulated signal that can be transmitting by its corresponding transmitter. It is powered by eight new D size batteries or AC/DC adaptor (Model: DPX572514). The power button in the front of the EUT's body will be lighted (green LED) while the power switch was on. And, there have a tuning knob for select the operated channel from the corresponding transmitter (Channel 01 to 03) at the bottom of the EUT. In additional, two volume button, BASS button and Light button in the front of the EUT is used to adjust the volume, activate bass boost and turn on the two lights on the woofer reflector area respectively.

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: S6LA-BROOKSTONE) 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 - 2001. Radiated measurement was performed in an Open Area Test Site and Conducted Emission measurement was performed in Shield Room. Preliminary scans were performed in the Open Area Test Site 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 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 - 2001.

The EUT is powered by an AC/DC Adaptor (Model: DPX572514).

The unit was operated standalone and placed in the center of the turntable. The wooden support stand enabled the engineer to maximize emissions through its placements in the three orthogonal axes.

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 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 receiving continuously.

2.2 EUT Exercising Software

There was no special software to exercise the device. Once the unit is powered up, it received 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 Tomoe Electronics Co. will be incorporated in each production model sold/leased in the United States.

No modifications were installed by Intertek Testing Services.

2.5 Measurement Uncertainty

When determining the test conclusion, the measurement uncertainty of test has been considered.

2.6 Support Equipment List and Description

Transmitter with FCC ID: S6LA-BROOKSTONE

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

Confirmed by:

Billy Chow
Senior Supervisor - Home Entertainment Electronics
Intertek Testing Services Hong Kong Ltd. ETL SEMKO
Agent for Tomoe Electronics Co.

Signature

May 26, 2005 Date

EXHIBIT 3

EMISSION RESULTS

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.

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 62.0 dBμV 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 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

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

AV = -10 dB

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

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

3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission
at
73.486 MHz

For electronic filing, the front view and back view of the test configuration photographs are 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 0.6 dB margin

TEST PERSONNEL:

Signature

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

May 26, 2005
Date

Company: Tomoe Electronics Co. Date of Test: April 28, 2005
Model: OUTDOOR WIRELESS SPEAKER BROOKSTONE
Worst case operating mode: RX

Table 1

Radiated Emissions

Channel 02

Polarization	Frequency (MHz)	Net at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
H	915.096	40.8	46.0	-5.2
H	1830.185	43.6	54.0	-10.4
H	2745.287	43.2	54.0	-10.8
H	3660.385	48.5	54.0	-5.5
H	4575.484	44.2	54.0	-9.8

Channel 03

Polarization	Frequency (MHz)	Net at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
H	916.698	40.6	46.0	-5.4
H	1833.395	43.2	54.0	-10.8
H	2750.096	43.4	54.0	-10.6
H	3666.784	49.0	54.0	-5.0
H	4583.485	44.6	54.0	-9.4

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 sign in the margin column shows emission below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. '*' Emission within restricted band fulfill the requirement of section 15.205.

Test Engineer: Terry C. H. Chan

Company: Tomoe Electronics Co. Date of Test: April 28, 2005
Model: OUTDOOR WIRELESS SPEAKER BROOKSTONE
Worst case operating mode: ON

Table 2

Radiated Emissions

Polarization	Frequency (MHz)	Net at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
V	56.036	32.8	40.0	-7.2
V	73.486	39.4	40.0	-0.6
V	85.946	33.9	40.0	-6.1
H	115.846	34.2	43.5	-9.3
H	154.629	34.0	43.5	-9.5
H	174.698	33.6	43.5	-9.9
H	213.704	32.9	43.5	-10.6

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 sign in the margin column shows emission below limit.

4. Horn antenna is used for the emission over 1000MHz.

5. '*' Emission within restricted band fulfill the requirement of section 15.205.

Test Engineer: Terry C. H. Chan

3.4 Conducted Emission Configuration Photograph

Worst Case Conducted Emission
at
0.215 MHz

For electronic filing, the front view, rear view and side view of the test configuration photographs are saved with filename: conducted photos.pdf.

Company: Tomoe Electronics Co. Date of Test: April 28, 2005
Model: OUTDOOR WIRELESS SPEAKER BROOKSTONE

Conducted Emissions
Section 15.107 Requirements

For Electronic filing, the conducted emission test result is saved with filename:
conduct.pdf

3.5 Conducted Emission Data

For electronic filing, the graph and data table of conducted emission are saved with filename: conduct.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 14.8 dB margin

TEST PERSONNEL:

Signature

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

May 26, 2005
Date

EXHIBIT 4

EQUIPMENT PHOTOGRAPHS

4.0 Equipment Photographs

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

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 and calculation of factor such as pulse desensitization and averaging factor (calculation and timing diagram).

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

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

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 the Part 15, Subpart B rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.4 - 2001.

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 axis to obtain maximum emission levels. The antenna height and polarization are also 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 8.2.

The frequency range scanned is 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 40 GHz, whichever is lower. For line conducted emissions, the range scanned is 150 kHz to 30 MHz.

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 were made as described in ANSI C63.4 - 2001.

The IF bandwidth used for measurement of radiated signal strength was 100 kHz or greater when frequency is below 1000 MHz. 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 8.1). Above 1000 MHz, a resolution bandwidth of 1 MHz is used.

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