

RadioShack Corporation

Application
For
Certification
(FCC ID: AAO430124)
Transmitter

06264842
TC/el
December 27, 2006

- The test results reported in this test report shall refer only to the sample actually tested and shall not refer or be deemed to refer to bulk from which such a sample may be said to have been obtained.
- This report shall not be reproduced except in full without prior authorization from Intertek Testing Services Hong Kong Limited
- For Terms And Conditions of the services, it can be provided upon request.
- The evaluation data of the report will be kept for 3 years from the date of issuance.

INTERTEK TESTING SERVICES

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
<i>EXHIBIT 9:</i>	Confidentiality Request

INTERTEK TESTING SERVICES

MEASUREMENT / TECHNICAL REPORT

RadioShack Corporation – MODEL: RadioShack 43-124

FCC ID: AAO430124

December 27, 2006

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

Equipment Type: Low Power Transmitter (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 [04-05-05 Edition] provision.

Report prepared by:	Ho Wai Kin, Ben
	Intertek Testing Services Hong Kong Ltd.
	2/F., Garment Center,
	576 Castle Peak Road,
	Kowloon, Hong Kong.
	Phone: 852-2173-8505
	Fax: 852-2371-0914

INTERTEK TESTING SERVICES

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	Measured Bandwidth.....	27
8.2	Discussion of Pulse Desensitization.....	28
8.3	Calculation of Average Factor.....	29
8.4	Emissions Test Procedures.....	30
9.0	<u>Confidentiality Request</u>	33

INTERTEK TESTING SERVICES

List of attached file

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
Test Report	Bandwidth Plot	bw.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
Cover Letter	Confidentiality Request	request.pdf

INTERTEK TESTING SERVICES

EXHIBIT 1

GENERAL DESCRIPTION

INTERTEK TESTING SERVICES

1.0 **General Description**

1.1 Product Description

The Equipment Under Test (EUT) is a Wireless Intercom (Transmitter Portion) operating at 910MHz, 911MHz, 912MHz and 913MHz. The EUT is powered by 6.0VDC (4 x "AA" size rechargeable batteries or AC/DC adaptor 120VAC 60Hz input, DC 9V 350mA output). After switching on the EUT and press the talk button. User can talk to each other with same channel selection. The number of channel can be selected is four and the channel switch is located in battery compartment. Also, it has LOCK function – use the intercom as a room monitor, CALL – use to calling another station, AUX input – to transmit audio to each intercom and Weather radio alert enabled function – listen to the radio or receive weather alerts in any room with an intercom.

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 portion. The receiver portion associated with the EUT is subjected to verification procedure.

INTERTEK TESTING SERVICES

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.

INTERTEK TESTING SERVICES

EXHIBIT 2

SYSTEM TEST CONFIGURATION

INTERTEK TESTING SERVICES

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 4 x "AA" size rechargeable batteries or AC/DC adaptor 120VAC 60Hz input, DC 9V 350mA output.

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.

INTERTEK TESTING SERVICES

2.4 Equipment Modification

Any modifications installed previous to testing by RadioShack Corporation 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

1. Cassette Player
2. 0.67m Audio Cable

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 RadioShack Corporation*



Signature

December 27, 2006

Date

INTERTEK TESTING SERVICES

EXHIBIT 3

EMISSION RESULTS

INTERTEK TESTING SERVICES

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.

INTERTEK TESTING SERVICES

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:

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

INTERTEK TESTING SERVICES

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.

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

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

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

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

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

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

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

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

INTERTEK TESTING SERVICES

3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission
at
455.003MHz

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

INTERTEK TESTING SERVICES

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 5.2dB margin

TEST PERSONNEL:



Signature

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

December 27, 2006
Date

INTERTEK TESTING SERVICES

Company: RadioShack Corporation
Model: RadioShack 43-124
Worst Case Operating Mode: Transmitting

Date of Test: December 04, 2006

Table 1

Radiated Emissions

Channel 01

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp (dB)	Antenna factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	910.005	71.2	16	33.0	88.2	94.0	-5.8
H	455.003	30.8	16	26.0	40.8	46.0	-5.2
H	1365.007	48.6	33	26.1	41.7	54.0	-12.3
H	1820.001	46.2	33	27.2	40.4	54.0	-13.6
H	2275.013	44.1	33	29.4	40.5	54.0	-13.5
H	2730.016	44.1	33	30.4	41.5	54.0	-12.5
H	3185.017	43.7	33	31.9	42.6	54.0	-11.4

Channel 04

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp (dB)	Antenna factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
H	913.000	71.5	16	33.0	88.5	94.0	-5.5
H	456.500	30.4	16	26.0	40.4	46.0	-5.6
H	1369.505	48.7	33	26.1	41.8	54.0	-12.2
H	1826.003	46.2	33	27.2	40.4	54.0	-13.6
H	2282.500	43.9	33	29.4	40.3	54.0	-13.7
H	2739.005	44.3	33	30.4	41.7	54.0	-12.3
H	3195.500	43.4	33	31.9	42.3	54.0	-11.7

- 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.
 5. All emissions below the peak limit.

Test Engineer: Terry C. H. Chan

INTERTEK TESTING SERVICES

Company: RadioShack Corporation
Model: RadioShack 43-124
Worst Case Operating Mode: Standby

Date of Test: December 04, 2006

Table 2

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
V	32.125	36.5	16	10.0	30.5	40.0	-9.5
V	40.003	36.4	16	10.0	30.4	40.0	-9.6
V	48.150	34.8	16	11.0	29.8	40.0	-10.2
V	60.000	35.5	16	10.0	29.5	40.0	-10.5
V	64.125	35.6	16	9.0	28.6	40.0	-11.4
V	68.006	36.0	16	8.0	28.0	40.0	-12.0

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.

5. All emissions below the peak limit.

Test Engineer: Terry C. H. Chan

INTERTEK TESTING SERVICES

3.4 Conducted Emission Configuration Photograph

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

INTERTEK TESTING SERVICES

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

December 27, 2006
Date

INTERTEK TESTING SERVICES

EXHIBIT 4

EQUIPMENT PHOTOGRAPHS

INTERTEK TESTING SERVICES

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.

INTERTEK TESTING SERVICES

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

INTERTEK TESTING SERVICES

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.

INTERTEK TESTING SERVICES

EXHIBIT 8

MISCELLANEOUS INFORMATION

INTERTEK TESTING SERVICES

8.0 **Miscellaneous Information**

The miscellaneous information includes details of the measured bandwidth and the test procedure.

INTERTEK TESTING SERVICES

8.1 Measured Bandwidth

For electronic filing, the plot shows the fundamental emission when modulated with 1kHz and 100dBSPL, 10cm from the Microphone of EUT and unmodulated are saved with filename: bw.pdf. From the plot, the field strength of any emissions appearing between the band edges and up to 10kHz above and below the band edges are attenuated at least 50dB below the level of the unmodulated carrier. It fulfil the requirement of 15.249(d).

INTERTEK TESTING SERVICES

8.2 Discussion of Pulse Desensitization

Pulse desensitivity is not applicable for this device. Since the transmitter transmits the RF signal continuously.

INTERTEK TESTING SERVICES

8.3 Calculation of Average Factor

The average factor is not applicable for this device as the transmitted signal is a continuously signal.

8.4 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.

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.

INTERTEK TESTING SERVICES

8.4 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.

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.

INTERTEK TESTING SERVICES

EXHIBIT 9

CONFIDENTIALITY REQUEST

INTERTEK TESTING SERVICES

9.0 **Confidentiality Request**

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