

Guangzhou Panyu Juda Car Audio Equipment Co., Ltd.

Application
For
Certification
FCC ID: ESX4000375

Bluetooth Speaker

Model: BL1602
Additional Model: AUVIO4000375

2.4GHz Transceiver

Report No.: SZ12060568-1

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart C for Intentional Radiator, mention 47 CFR [10-1-11]

Prepared and Checked by:

Approved by:

Sign on file

Andy Yan
Engineer

Billy Li
Supervisor
Date: 1 August, 2012

- 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.
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- 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.

TRF No.: FCC 15C_TX_b

INTERTEK TESTING SERVICES

LIST OF EXHIBITS

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MEASUREMENT/TECHNICAL REPORT

**Guangzhou Panyu Juda Car Audio Equipment Co., Ltd. - MODEL: BL1602
Additional Model: AUVIO4000375**

FCC ID: ESX4000375

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

Equipment Type: DXX - Part 15 Low Power Communication Device Transmitter

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 [10-1-11 Edition] provision.

Report prepared by:

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List of attached file

Exhibit type	File Description	Filename
Test Report	Test Report	report.pdf
Test Setup Photo	Radiated Emission	radiated photos.pdf
Test Setup Photo	Conducted Emission	conducted photos.pdf
Test Report	Bandedge Plot	bandedge.pdf
Test Report	20dB BW 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
Operation Description	Technical Description	descri.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
Cover Letter	Letter of Agency	agency.pdf
Cover Letter	Certification Agreement	agreement.pdf

EXHIBIT 1

GENERAL DESCRIPTION

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1.0 General Description

1.1 Product Description

The equipment under test (EUT) is a Bluetooth Speaker with an AUX INPUT Port. The EUT is powered by DC 3.7V rechargeable battery and charged by PC USB Port. For more information, pls. refer to the user manual.

Antenna Type: Integral antenna

Modulation Type: GFSK, $\pi/4$ -DQPSK and 8-DPSK

The Model: AUVIO4000375 is the same as the Model: BL1602 in hardware aspect. The difference in the appearance, trade name and model no. serve as marketing strategy.

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 transceiver for the Bluetooth Speaker, and there is no corresponding unit for certification.

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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 (2009). Radiated emission measurement was performed in Semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the 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. All other measurements were made in accordance with the procedures in part 2 of CFR 47.

1.4 Test Facility

The Semi-Anechoic chamber and shield room used to collect the radiated data and conducted data are **Shenzhen EMTEK Co., Ltd.** and located at Bldg.69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, 518052 China. This test facility and site measurement data have been fully placed on file with the FCC (Registration Number: 709623).

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 (2009).

The EUT was powered by a 3.7V fully charged battery and charged by PC USB Port through AC 120V/60Hz during the test and only the worst data was reported in this report.

All packets DH1, DH3 & DH5 mode in all modulation type GFSK, $\pi/4$ -DQPSK and 8-DPSK were tested, and only the worst data was reported in this report.

For maximizing emissions below 30 MHz, the EUT was rotated through 360°, the centre of the loop antenna was placed 1 meter above the ground, and the antenna polarization was changed. For maximizing emission at and above 30 MHz, 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. This step by step procedure for maximizing emissions led to the data report 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 a turn table, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

2.2 EUT Exercising Software

The EUT exercise program (provided by client) used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The worst case configuration is used in all specified testing.

The parameters of test software setting:

During the test, Channel and power controlling software provided by the applicant was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the application and is going to be fixed on the firmware of the end product.

2.3 Special Accessories

N/A.

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2.4 Equipment Modification

Any modifications installed previous to testing by Guangzhou Panyu Juda Car Audio Equipment Co., Ltd. will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd Kejiyuan Branch.

2.5 Measurement Uncertainty

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

2.6 Support Equipment List and Description

Description	Manufacturer	Model No.
Notebook	Lenovo	20020
USB Cable	N/A	1.2m Unshielded
AUX IN Cable	N/A	1.5m Unshielded

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).

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3.1 Radiated Test Results

A sample calculation, configuration photographs and data tables of the emissions are included.

3.1.1 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:

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

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 dB μ V
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 dB μ V/m

Level in μ V/m = Common Antilogarithm [(32 dB μ V/m)/20] = 39.8 μ V/m

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3.1.2 Radiated Emission Configuration Photograph

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

3.1.3 Radiated Emissions

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.

Worst Case Radiated Emission
at
418.622 MHz

Judgement: Passed by 3.4 dB

TEST PERSONNEL:

Sign on file

Andy Yan, Engineer
Typed/Printed Name

1 August, 2012
Date

INTERTEK TESTING SERVICES

Applicant: Guangzhou Panyu Juda Car Audio Equipment Co., Ltd.

Date of Test: 1 August, 2012

Model: BL1602

Sample: 1/1

Worst Case Operating Mode: Transmit with charging from notebook

Table 1

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)
Horizontal	191.667	52.4	26.0	13.2	39.6	43.5	-3.9
Horizontal	418.622	51.2	26.0	17.4	42.6	46.0	-3.4
Horizontal	698.430	35.1	26.0	24.0	33.1	46.0	-12.9
Vertical	185.448	50.0	26.0	11.9	35.9	43.5	-7.6
Vertical	376.650	39.9	26.0	16.3	30.2	46.0	-15.8
Vertical	667.339	34.5	26.0	22.8	31.3	46.0	-14.7

- NOTES:
1. Quasi-Peak detector is used except for others 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. All emissions are below the QP limit.

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3.1.4 Transmitter Spurious Emissions (Radiated)

Worst Case Radiated Emission
at
7440.000 MHz

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

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 21.1 dB

TEST PERSONNEL:

Sign on file

Andy Yan, Engineer
Typed/Printed Name

1 August, 2012
Date

INTERTEK TESTING SERVICES

Applicant: Guangzhou Panyu Juda Car Audio Equipment Co., Ltd.

Date of Test: 1 August, 2012

Model: BL1602

Sample: 1/1

Worst Case Operating Mode: Transmit with charging from notebook

Table 2

Radiated Emissions

(2402MHz)

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	2402.000	88.3	37.4	27.6	78.5	114.0	-35.5
Horizontal	4804.000	53.0	37.3	31.5	47.2	74.0	-26.8
Horizontal	7206.000	55.1	36.5	33.1	51.7	74.0	-22.3

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (-dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	2402.000	88.3	37.4	27.6	30.1	48.4	94.0	-45.6
Horizontal	4804.000	53.0	37.3	31.5	30.1	17.1	54.0	-36.9
Horizontal	7206.000	55.1	36.5	33.1	30.1	21.6	54.0	-32.4

Notes: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meter. Harmonic 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 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: Andy Yan

TRF No.: FCC 15C_TX_b

FCC ID: ESX4000375

Report No.: SZ12060568-1

INTERTEK TESTING SERVICES

Applicant: Guangzhou Panyu Juda Car Audio Equipment Co., Ltd.
Date of Test: 1 August, 2012
Model: BL1602
Sample: 1/1
Worst Case Operating Mode: Transmit with charging from notebook

Table 3

Radiated Emissions

(2441MHz)

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	2441.000	90.4	37.4	27.5	80.5	114.0	-33.5
Horizontal	4882.000	50.7	37.3	31.5	44.9	74.0	-29.1
Horizontal	7323.000	55.6	36.5	33.1	52.2	74.0	-21.8

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (-dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	2441.000	90.4	37.4	27.5	30.1	50.4	94.0	-43.6
Horizontal	4882.000	50.7	37.3	31.5	30.1	14.8	54.0	-39.2
Horizontal	7323.000	55.6	36.5	33.1	30.1	22.1	54.0	-31.9

- Notes:
1. Peak Detector Data unless otherwise stated.
 2. All measurements were made at 3 meter. Harmonic 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 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: Andy Yan

INTERTEK TESTING SERVICES

Applicant: Guangzhou Panyu Juda Car Audio Equipment Co., Ltd.
Date of Test: 1 August, 2012
Model: BL1602
Sample: 1/1
Worst Case Operating Mode: Transmit with charging from notebook

Table 4

Radiated Emissions

(2480MHz)

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)
Horizontal	2480.000	90.0	37.4	27.5	80.1	114.0	-33.9
Horizontal	4960.000	50.9	37.3	31.6	45.2	74.0	-28.8
Horizontal	7440.000	56.0	36.5	33.4	52.9	74.0	-21.1

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Average Factor (-dB)	Net at 3m (dB μ V/m)	Average Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	2480.000	90.0	37.4	27.5	30.1	50.0	94.0	-44.0
Horizontal	4960.000	50.9	37.3	31.6	30.1	15.1	54.0	-38.9
Horizontal	7440.000	56.0	36.5	33.4	30.1	22.8	54.0	-31.2

- Notes:
1. Peak Detector Data unless otherwise stated.
 2. All measurements were made at 3 meter. Harmonic 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 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: Andy Yan

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3.2 Conducted Emission at Mains Terminal

3.2.1 Conducted Emissions Configuration Photograph

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

3.2.2 Conducted Emissions

Worst Case Line-Conducted Configuration
at
8.24 MHz

Judgement: Passed by 5.14 dB margin

TEST PERSONNEL:

Sign on file

Andy Yan, Engineer
Typed/Printed Name

1 August, 2012
Date

INTERTEK TESTING SERVICES

Applicant: Guangzhou Panyu Juda Car Audio Equipment Co., Ltd.

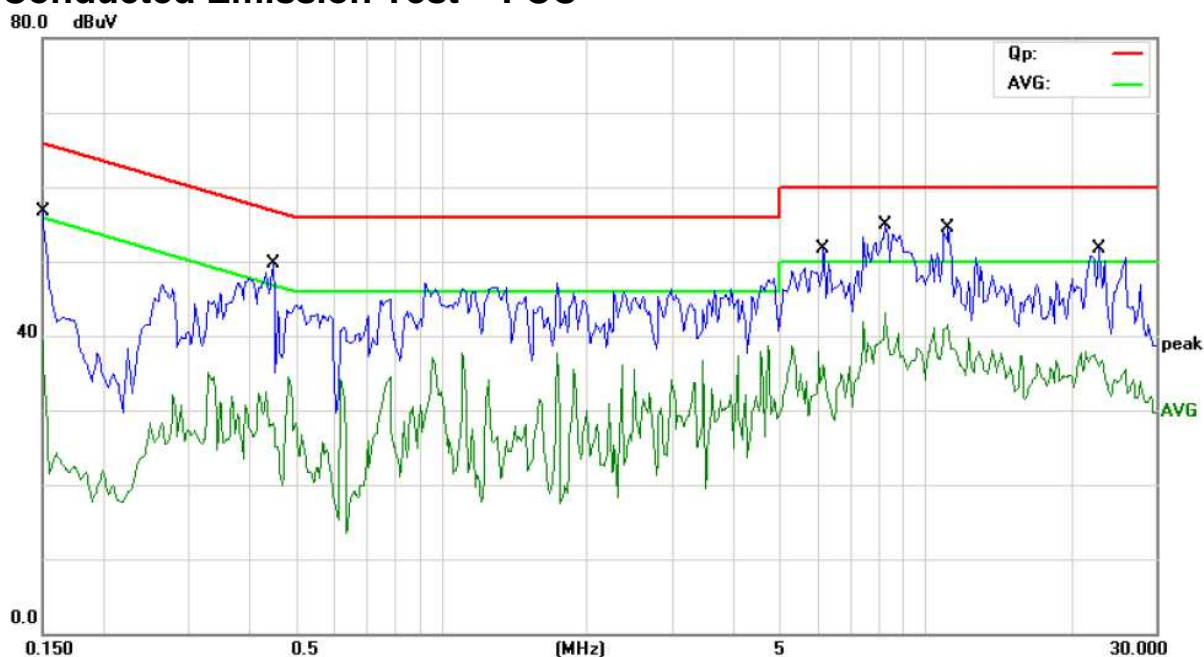
Date of Test: 1 August, 2012

Model: BL1602

Sample: 1/1

Worst Case Operating Mode: Transmit with charging from notebook (2441MHz)

Conducted Emission Test – FCC



Result Table QP

Frequency (MHz)	QuasiPeak (dB µ V)	Line	Margin (dB)	Limit (dB µ V)
0.150000	56.78	L1	-9.22	66.00
0.450000	49.64	L1	-7.24	56.88
6.180000	51.63	L1	-8.37	60.00
8.240000	54.86	L1	-5.14	60.00
11.15000	54.60	L1	-5.40	60.00
22.55000	51.61	L1	-8.39	60.00

Result Table AV

Frequency (MHz)	Average (dB µ V)	Line	Margin (dB)	Limit (dB µ V)
0.150000	39.25	L1	-16.75	56.00
0.450000	28.25	L1	-18.63	46.88
6.180000	36.02	L1	-13.98	50.00
8.240000	43.02	L1	-6.98	50.00
11.15000	41.52	L1	-8.48	50.00
22.55000	36.82	L1	-13.18	50.00

INTERTEK TESTING SERVICES

Applicant: Guangzhou Panyu Juda Car Audio Equipment Co., Ltd.

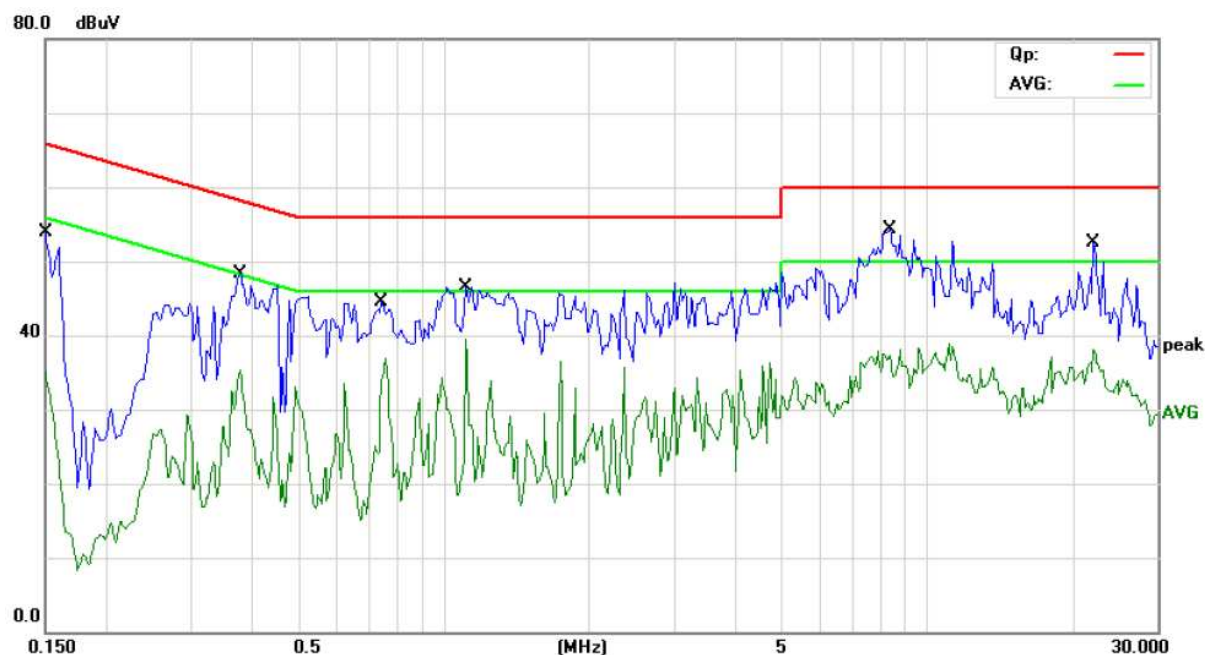
Date of Test: 1 August, 2012

Model: BL1602

Sample: 1/1

Worst Case Operating Mode: Transmit with charging from notebook (2441MHz)

Conducted Emission Test - FCC



Result Table QP

Frequency (MHz)	QuasiPeak (dB µ V)	Line	Margin (dB)	Limit (dB µ V)
0.150000	53.97	N	-12.03	66.00
0.380000	48.32	N	-9.96	58.28
0.745000	44.54	N	-11.46	56.00
1.115000	46.54	N	-9.46	56.00
8.290000	54.00	N	-6.00	60.00
22.12500	52.54	N	-7.46	60.00

Result Table AV

Frequency (MHz)	Average (dB µ V)	Line	Margin (dB)	Limit (dB µ V)
0.150000	35.05	N	-20.95	56.00
0.380000	35.24	N	-13.04	48.28
0.745000	35.96	N	-10.04	46.00
1.115000	39.53	N	-6.47	46.00
8.290000	37.48	N	-12.52	50.00
22.12500	38.11	N	-11.89	50.00

TRF No.: FCC 15C_TX_b

FCC ID: ESX4000375

Report No.: SZ12060568-1

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.pdf & internal photos.pdf.

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

TRF No.: FCC 15C_TX_b
FCC ID: ESX4000375
Report No.: SZ12060568-1

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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

TRF No.: FCC 15C_TX_b
FCC ID: ESX4000375
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8.0 Miscellaneous Information

This miscellaneous information includes details of the measured bandedge, the 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: bandedge.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 fulfils the requirement of 15.249(d).

Peak Measurement

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

(i) Lower channel 2402MHz:

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

$$\begin{aligned} &= 78.5 \text{ dB}\mu\text{v/m} - 42.7 \text{ dB} \\ &= 35.8 \text{ dB}\mu\text{v/m} \end{aligned}$$

(ii) Upper channel 2480MHz:

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

$$\begin{aligned} &= 80.1 \text{ dB}\mu\text{v/m} - 47.0 \text{ dB} \\ &= 33.1 \text{ dB}\mu\text{v/m} \end{aligned}$$

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

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8.1 Bandedge Plot (cont'd)

Pursuant to FCC part 15 Section 15.215(c), the 20dB bandwidth of the emission was contained within the frequency band designated (mentioned as above) which the EUT operated. The effects, if any, from frequency sweeping, frequency hopping, other modulation techniques and frequency stability over excepted variations in temperature and supply voltage were considered.

Figure 8.1 Bandwidth

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8.2 Discussion of Pulse Desensitization

Pulse desensitivity is not applicable for this device. The effective period (T_{eff}) is approximately 625 μs for Bluetooth. With a resolution bandwidth (3dB) of 1MHz, so the pulse desensitivity factor is 0dB.

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8.3 Transmitter Duty Cycle Calculation, FCC Rule 15.35(b, c)

Based on the Bluetooth Specification, transmitter ON time is independent of packet type (DH1, DH3 and DH5) and packet length (single-slot and multi-slot). The maximum transmitter ON time for the Bluetooth is 625 μ s.

Each TX and RX time slot is 625 μ s in length. A TDD scheme is used where master and slave alternately transmit. For one period for a pseudo-random hopping through all 79 RF channels, for DH5:

Time of 1 hopset (5 TX slots + 1 RX slot) = 0.625 ms x 6 = 3.75 ms

Time of 1 cycle = 3.75 ms x 79 = 296.25 ms

Average factor = 20 log (3.125 / 100) = -30.1 dB

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8.4 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services 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 - 2009.

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.

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 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower.

Detector function for conducted emissions is in QP & AV mode and IFBW setting is 9 kHz from the frequency band 150 kHz to 30MHz.

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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 - 2009.

The IF bandwidth used for measurement of radiated signal strength was 10 kHz for emission below 30 MHz and 120 kHz for emission from 30 MHz to 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. Above 1000 MHz, a resolution bandwidth of 1 MHz is used.

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

EXHIBIT 9
TEST EQUIPMENT LIST

INTERTEK TESTING SERVICES

9.0 Test Equipment List

Equipment	Manufacturer	Model No.	Last Cal.	Due.Date
EMI Test Receiver	Rohde & Schwarz	ESU	May 29, 2012	May 29, 2013
Pre-Amplifier	HP	8447D	May 29, 2012	May 29, 2013
Pre-Amplifier	A.H.	PAM-0126	May 29, 2012	May 29, 2013
Bilog Antenna	Schwarzbeck	VULB9163	May 29, 2012	May 29, 2013
Active Loop Antenna	Schwarzbeck	FMZB 1519	May 29, 2012	May 29, 2013
Horn Antenna	Schwarzbeck	BBHA 9170	May 29, 2012	May 29, 2013
Cable	Schwarzbeck	AK9513	May 29, 2012	May 29, 2013
Cable	Rosenberger	N/A	May 29, 2012	May 29, 2013
Cable	Schwarzbeck	AK9513	May 29, 2012	May 29, 2013
Cable	Schwarzbeck	AK9513	May 29, 2012	May 29, 2013
spectrum analyzer	Agilent	E4407B	May 29, 2012	May 29, 2013
Anechoic Chamber	ETS	RFD-F/A-102	May 13, 2012	May 13, 2013
Test Receiver	Rohde & Schwarz	ESCS30	May 29, 2012	May 29, 2013
L.I.S.N.	Rohde & Schwarz	ENV216	May 29, 2012	May 29, 2013
Shielding room	ETS	RFD-102	May 29, 2012	May 29, 2013