

RF EXPOSURE REPORT



Report No.: 17021127-FCC-H1

Supersede Report No.: N/A

Applicant	Ningbo Lumiaudio Electronic Technology LTD	
Product Name	Tube Amplifier With Bluetooth Stereo	
Model No.	AMP-T100	
Serial Model	N/A	
Test Standard	FCC 2.1091	
Test Date	September 15 to November 7, 2017	
Issue Date	November 8, 2017	
Test Result	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail
Equipment complied with the specification	<input checked="" type="checkbox"/>	
Equipment did not comply with the specification	<input type="checkbox"/>	
Amos. Xia	Deon Dai	
Amos Xia Test Engineer	Deon Dai Engineer Reviewer	
<p>This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only</p>		

Issued by:

SIEMIC (Nanjing-China) Laboratories

2-1 Longcang Avenue Yuhua Economic and
Technology Development Park, Nanjing, China

Tel:+86(25)86730128/86730129 Fax:+86(25)86730127 Email: China@siemic.com.cn

Laboratories Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.



In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Scope
USA	EMC, RF/Wireless, SAR, Telecom
Canada	EMC, RF/Wireless, SAR, Telecom
Taiwan	EMC, RF, Telecom, SAR, Safety
Hong Kong	RF/Wireless, SAR, Telecom
Australia	EMC, RF, Telecom, SAR, Safety
Korea	EMI, EMS, RF, SAR, Telecom, Safety
Japan	EMI, RF/Wireless, SAR, Telecom
Singapore	EMC, RF, SAR, Telecom
Europe	EMC, RF, SAR, Telecom, Safety

Test Report No.	17021127-FCC-H1
Page	3 of 8

This page has been left blank intentionally.

Test Report No.	17021127-FCC-H1
Page	4 of 8

CONTENTS

1	REPORT REVISION HISTORY.....	5
2	CUSTOMER INFORMATION	5
3	TEST SITE INFORMATION.....	5
4	EQUIPMENT UNDER TEST (EUT) INFORMATION	6
5	FCC §2.1091 - MAXIMUM PERMISSIBLE EXPOSURE (MPE).....	7

1 Report Revision History

Report No.	Report Version	Description	Issue Date
17021127-FCC-H1	NONE	Original	November 8, 2017

2 Customer information

Applicant Name	Ningbo Lumiaudio Electronic Technology LTD
Applicant Add	22/F.,Building 1,Lisi Plaza,Huifeng East Road ,Ningbo,China 315100
Manufacturer	Ningbo Lumiaudio Electronic Technology LTD
Manufacturer Add	22/F.,Building 1,Lisi Plaza,Huifeng East Road ,Ningbo,China 315100

3 Test site information

Lab performing tests	SIEMIC (Nanjing-China) Laboratories
Lab Address	2-1 Longcang Avenue Yuhua Economic and Technology Development Park, Nanjing, China
FCC Test Site No.	694825
IC Test Site No.	4842B-1
Test Software	EZ_EMC

4 Equipment under Test (EUT) Information

Description of EUT: Tube Amplifier With Bluetooth Stereo

Main Model: AMP-T100

Serial Model: N/A

Date EUT received: September 11, 2017

Test Date(s): September 15 to November 7, 2017

Output power BT:3.091 dBm

Antenna Gain: Bluetooth: 0 dBi

Type of Modulation: Bluetooth: GFSK& π /4-DQPSK&8DPSK

RF Operating Frequency (ies): Bluetooth: 2402-2480 MHz

Number of Channels: Bluetooth: 79CH

Port: USB Port、HEADPHONES Port、CD Port*2、DVD Port*2、Power Port

Input Power: 110V 60Hz

Trade Name : N/A

FCC ID: 2AKKHAMP

5 FCC §2.1091 - Maximum Permissible exposure (MPE)

Applicable Standard

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for General Population/Uncontrolled Exposure

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minutes)
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

Test Data

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

Where: S = power density (in appropriate units, e.g. mW/cm²)

P = power input to the antenna (in appropriate units, e.g., mW).

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Type	Modulation	CH	Freq (MHz)	Conducted Power (dBm)	Tune Up Power (dBm)
Output power	GFSK	High	2480	3.091	2.5±1
	$\pi/4$ DQPSK	High	2480	-0.405	-1±1
	8-DPSK	High	2480	-0.519	-1±1

For the antenna manufacturer provide only used limited to ERP/EIRP or radiated spurious emission test. The MPE evaluation as below:

BLE

The maximum peak output power (turn-up power) in low channel of BT is 3.5 dBm

Maximum peak output power (turn-up power) at antenna input terminal: 2.34 (mW)

Prediction distance: >20 (cm)

Predication frequency: 2402(MHz) lowest frequency

Antenna Gain (typical): 0 (dBi)

Antenna Gain (typical): 1 (numeric)

The worst case is power density at predication frequency at 20 cm: 0.0004 (mW/cm²)

MPE limit for general population exposure at prediction frequency: 1 (mW/cm²)

$0.0004 \text{ (mW/cm}^2\text{)} < 1 \text{ (mW/cm}^2\text{)}$

The maximum peak output power (turn-up power) in Middle channel of BT is 0 dBm

Maximum peak output power (turn-up power) at antenna input terminal: 1 (mW)

Prediction distance: >20 (cm)

Predication frequency: 2440(MHz) lowest frequency

Antenna Gain (typical): 0 (dBi)

Antenna Gain (typical): 1 (numeric)

The worst case is power density at predication frequency at 20 cm: 0.0002 (mW/cm²)

MPE limit for general population exposure at prediction frequency: 1 (mW/cm²)

$0.0002 \text{ (mW/cm}^2\text{)} < 1 \text{ (mW/cm}^2\text{)}$

The maximum peak output power (turn-up power) in High channel of BT is 0 dBm

Maximum peak output power (turn-up power) at antenna input terminal: 1 (mW)

Prediction distance: >20 (cm)

Predication frequency: 2480(MHz) lowest frequency

Antenna Gain (typical): 0 (dBi)

Antenna Gain (typical): 1 (numeric)

The worst case is power density at predication frequency at 20 cm: 0.0002 (mW/cm²)

MPE limit for general population exposure at prediction frequency: 1 (mW/cm²)

$0.0002 \text{ (mW/cm}^2\text{)} < 1 \text{ (mW/cm}^2\text{)}$

Result: Pass