

RF EXPOSURE REPORT

FOR

Applicant	:	ION Audio, LLC
Address	:	200 Scenic View Drive, Cumberland, RI 02864 U.S.A.
Equipment under Test	:	Bluetooth Speaker
Model No.	:	TOTAL PA™ ULTIMATE, iPA161, iPA161*****, TOTAL PA***** , TOTAL PA EXTREME
HVIN	:	TOTAL PA™ ULTIMATE
Project Code	:	iPA161, iPA158
Trade Mark	:	
FCC ID	:	2AB3E-IPA158
Manufacturer	:	ION Audio, LLC
Address	:	200 Scenic View Drive, Cumberland, RI 02864 U.S.A.

Issued By: Dongguan Dongdian Testing Service Co., Ltd.

Add.: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park,
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REPORT

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Test Report Declare

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Standard Used: KDB447498 D01 General RF Exposure Guidance v06

We Declare:

The equipment described above is assessed by Dongguan Dongdian Testing Service Co., Ltd and in the configuration assessed the equipment complied with the standards specified above. The assessed results are contained in this report and Dongguan Dongdian Testing Service Co., Ltd is assumed of full responsibility for the accuracy and completeness of these assess.

After evaluation, our opinion is that the equipment In Accordance with above standard.

Report No.:	DDT-R22081525-2E03		
Date of Receipt:	Sep. 30, 2022	Date of Test:	Sep. 30, 2022 ~ Oct. 25, 2022

Prepared By:

Sanvin Zheng

Sanvin Zheng/Engineer

Approved By:



Damon Hu/EMC Manager

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Dongguan Dongdian Testing Service Co., Ltd.

Revision History

Rev.	Revisions	Issue Date	Revised By
---	Initial issue	Oct. 26, 2022	

Note:

a. This report adds model TOTAL PA™ ULTIMATE, iPA161, iPA161***** and TOTAL PA*****. Based on the report DDT-R21090704-2E02, these models of Bluetooth chip is the same as TOTAL PA EXTREME. The difference is that the shell size is changed to 12 inches, some lights are added, supports OTA functionality and the tweeter is updated.

b. TOTAL PA™ ULTIMATE, iPA161, iPA161***** and TOTAL PA***** (“*” can be “0-9”, “a-z”, “A-Z”, “blank” or “-” for marketing purpose) all models are identical except model difference, therefore the test performed on the model TOTAL PA™ ULTIMATE. All test items have been tested.

c. Please refer to report DDT-R21090704-2E02 for the other original data.

1. General Information

1.1. Description of equipment

EUT* Name	: Bluetooth Speaker
Model Number	: TOTAL PA™ ULTIMATE, iPA161, iPA161*****, TOTAL PA*****, TOTAL PA EXTREME
Model Differences	: TOTAL PA™ ULTIMATE, iPA161, iPA161*****, TOTAL PA***** (“*” can be “0-9”, “a-z”, “A-Z”, “blank” or “-” for marketing purpose) All models are identical except model difference , therefore the test performed on the model TOTAL PA™ ULTIMATE .
EUT function description	: Please reference user manual of this device
Power Supply	: 100-120V~, 60Hz
Radio Specification	: Bluetooth V5.0
Operation Frequency	: 2402 MHz - 2480 MHz
Modulation	: GFSK, $\pi/4$ -DQPSK, 8DPSK
Data rate	: 1 Mbps, 2 Mbps, 3 Mbps
Antenna Gain	: 2.81 dBi
Sample Number	: S22081525-04 for conductive S22081525-05 for radiation

1.2. Assess laboratory

Dongguan Dongdian Testing Service Co., Ltd.

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Tel.: +86-0769-38826678, <http://www.dgddt.com>, Email: ddt@dgddt.com.

CNAS Accreditation No. L6451; A2LA Accreditation Number: 3870.01

FCC Designation Number: CN1182, Test Firm Registration Number: 540522

Innovation, Science and Economic Development Canada Site Registration Number: 10288A

Conformity Assessment Body identifier: CN0048

VCCI facility registration number: C-20087, T-20088, R-20123, R-20155, G-20118

2. RF Exposure Evaluation

2.1. Requirement

Systems operating under the provisions of FCC 47 CFR 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.

In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.

Limits for General Population/Uncontrolled Exposure

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

2.2. Calculation method

$$E(\text{V/m}) = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } S(\text{mW/cm}^2) = \frac{E^2}{377}$$

E = Electric field (V/m)

P = Peak RF output power (mW)

G = EUT Antenna numeric gain (numeric)=

d = Separation distance between radiator and human body (m)

The formula can be changed to

We can change the formula to:

$$S = \frac{30 \times P \times G}{377 \times d^2} \quad \text{or, } d = \sqrt{\frac{30 \times P \times G}{377 \times S}}$$

From the peak EUT RF output power, the minimum mobile separation distance, d= 0.2 m, as well as the gain of the used antenna, the RF power density can be obtained.

2.3. Estimation result

Mode	PK Output power (dBm)	Output power (mW)	Antenna Gain (dBi)	Antenna Gain (linear)	MPE Values (mW/cm ²)	MPE Limit (mW/cm ²)
Bluetooth Max power	3.41	2.19	2.81	1.91	0.00083	1
BLE Max power	9.15	8.22	2.81	1.91	0.00312	1

Note: The estimation distance is 20 cm

Conclusion: The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

END OF REPORT