RADIO TEST REPORT

Report No: STS2109135H01

Issued for

Turtlebox Audio LLC

11020 Katy Freeway Suite 202, Houston, Texas, The United States

Product Name:	Bluetooth Speaker
Brand Name:	Turtlebox
Model Name:	Turtlebox
Series Model:	N/A
FCC ID:	2A28W-TURTLEBOX
Test Standard:	FCC 47CFR §2.1091

Shenzhen STS Test Services Co., Ltd.
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Test Report Certification

Applicant's Name..... :	Turtlebox Audio LLC
Address..... :	11020 Katy Freeway Suite 202 ,Houston ,Texas , The United States
Manufacturer's Name..... :	Turtlebox Audio LLC
Address..... :	11020 Katy Freeway Suite 202 ,Houston ,Texas , The United States

Product Description

Product Name..... :	Bluetooth Speaker
Brand Name ..... :	Turtlebox
Model Name ..... : ..	Turtlebox
Series Model..... :	N/A
Standards ..... :	FCC 47CFR §2.1091

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Date of Test ..... :	
Date of receipt of test item..... :	16 Sept. 2021
Date (s) of performance of tests ..... :	16 Sept. 2021 ~ 30 Sept. 2021
Date of Issue ..... :	30 Sept. 2021
Test Result..... :	**Pass**

Testing Engineer : Chris Chen

(Chris Chen)

Technical Manager : Sean She

(Sean she)

Authorized Signatory : Vita Li

(Vita Li)

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Revision History

Rev.	Issue Date	Report No.	Effect Page	Contents
00	30 Sept. 2021	STS2109135H01	ALL	Initial Issue

1. GENERAL INFORMATION

1.1 GENERAL DESCRIPTION OF THE EUT

Product Name	Bluetooth Speaker
Brand Name	Turtlebox
Model Name	Turtlebox
Series Model	N/A
Model Difference	N/A
Product Description	The EUT is Bluetooth Speaker Operation Frequency: BT/BLE: 2402~2480 MHz Modulation Type: BT/BLE: GFSK(1Mbps), π/4-DQPSK(2Mbps), 8DPSK(3Mbps) Antenna gain: 2.13dBi Antenna Designation: PIFA Antenna
Adapter	Input: 100-240V 50/60hz 1.25A Output:15V 3A
Battery	Rated Voltage:11.1V Charge Limit Voltage: 12.6V MAX Capacity: 7800mAh / 86.58Wh
Hardware version number	20210713_v2.71
Software Version Number	20210713_v2.71

1.2 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD
Add. : A 1/F, Building B, Zhuoke Science Park, No.190 Chongqing Road, HepingShequ, Fuyong Sub-District, Bao'an District, Shenzhen, Guang Dong, China

FCC test Firm Registration Number: 625569

IC test Firm Registration Number: 12108A

A2LA Certificate No.: 4338.01

2. FCC 47CFR §2.1091 REQUIREMENT

2.1 TEST STANDARDS

The limit for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 is followed. The gain of the antennas used in the product is extracted from the Antenna data sheets provided and also the maximum total power input to the antenna is measured. Through the Friis transmission formula and the maximum gain of the antenna, we can calculate the distance, away from the product, where the limit of MPE is reached.
Although the Friis Transmission formula is far field assumption, the calculated result of that is an over-prediction for near field power density. It is taken as worst case to specify the safety range.

2.2 LIMIT

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environmental impact of the human exposure to radio-frequency (RF) radiation as specified in 1.1307 (b)

Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)
Limits for Occupational / controlled Exposures			
300 - 1500	--	--	F/300
1500 – 100000	--	--	5.0
Limits for General population / Uncontrolled Exposure			
300 - 1500	--	--	F/1500
1500 – 100000	--	--	1.0

F= Frequency in MHz

Friss Formula

Friss Transmission Formula: $Pd = (Pout * G) / (4*pi*r^2)$

Where

Pd = power density in mW/cm^2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = Distance between observation point and the center of radiator in cm

If we know the maximum gain of the antenna and the total output power to the antenna, through calculation, we will know MPE value at distance 20cm.

2.3 EUT OPERATION CONDITION

EUT was enabled to transmit and receive at lowest, middle and highest channels.

2.4 CLASSIFICATION

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. Warning statement to the user for keeping at least 20cm or more separation distance from the antenna should be included in the User manual. So, this device is classified as Mobile device.

2.5 TEST RESULT

Turn up

Mode	Detector	Turn up Power
GFSK	AV	-6±1dBm
GFSK(BLE)	AV	-6±1dBm

ANT Gain (G)

2402-2483.5MHz: 2.13dBi (gain of antenna in linear scale=1.633)

Protocol	**Max Turn up Power (dBm)**	**Max Turn up Power (mW)**	**ANT Gain(gain of antenna in linear scale)**	**Power Density (mW/cm²)**	**Limit (mW/cm²)**	**Result**
GFSK	-5	0.3162	1.633	0.0001	1	Pass
GFSK(BLE)	-5	0.3162	1.633	0.0001	1	Pass

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