

# RF Exposure Evaluation Report

**Product** : True Wireless Stereo Earphone  
**Trade mark** : N/A  
**Model/Type reference** : BTW-V2  
**Serial Number** : BTW-V1, BTW-105Q, BTW-106Q, BTW-107Q  
**Report Number** : EED32L00168901  
**FCC ID** : 2ADQABTW-V2  
**Date of Issue** : Aug. 08, 2019  
**Test Standards** : 47 CFR Part 1.1307(2015)  
47 CFR Part 1.1310(2015)  
KDB447498D01v06  
**Test result** : PASS

Prepared for:

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Aug. 08, 2019

Check No:3096312708



## 2 Version

| Version No. | Date          | Description |
|-------------|---------------|-------------|
| 00          | Aug. 08, 2019 | Original    |
|             |               |             |
|             |               |             |

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## 4 General Information

### 4.1 Client Information

|                          |                                                                                            |
|--------------------------|--------------------------------------------------------------------------------------------|
| Applicant:               | ShenZhen iFree Electronic Technology Co., Ltd.                                             |
| Address of Applicant:    | 7F, A9 Building, Tianrui Industiral Zone, No.35 Fuyuan 1st, Fuyong, Baoan, Shenzhen, China |
| Manufacturer:            | ShenZhen iFree Electronic Technology Co., Ltd.                                             |
| Address of Manufacturer: | 7F, A9 Building, Tianrui Industiral Zone, No.35 Fuyuan 1st, Fuyong, Baoan, Shenzhen, China |
| Factory:                 | ShenZhen iFree Electronic Technology Co., Ltd.                                             |
| Address of Factory:      | 7F, A9 Building, Tianrui Industiral Zone, No.35 Fuyuan 1st, Fuyong, Baoan, Shenzhen, China |

### 4.2 General Description of EUT

|                                  |                                      |
|----------------------------------|--------------------------------------|
| Product Name:                    | True Wireless Stereo Earphone        |
| Test Model No:                   | BTW-V2                               |
| Serial Number:                   | BTW-V1, BTW-105Q, BTW-106Q, BTW-107Q |
| Trade Mark:                      | N/A                                  |
| EUT Supports Radios application: | BT 5.0 Single mode, 2402-2480MHz;    |

### 4.3 Product Specification subjective to this standard

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| Frequency Range:                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2402-2480MHz                                                                             |
| Modulation Type:                                                                                                                                                                                                                                                                                                                                                                                                                                                   | GFSK, $\pi/4$ DQPSK, 8DPSK                                                               |
| Number of Channels:                                                                                                                                                                                                                                                                                                                                                                                                                                                | 79                                                                                       |
| Test Power Grade:                                                                                                                                                                                                                                                                                                                                                                                                                                                  | N/A(manufacturer declare)                                                                |
| Test Software of EUT:                                                                                                                                                                                                                                                                                                                                                                                                                                              | N/A(manufacturer declare)                                                                |
| Antenna Type:                                                                                                                                                                                                                                                                                                                                                                                                                                                      | internal antenna                                                                         |
| Antenna Gain:                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 4.97dBi                                                                                  |
| Power Supply:                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Battery 3.7V                                                                             |
| Max Conducted Peak Output Power:                                                                                                                                                                                                                                                                                                                                                                                                                                   | 4.753dBm<br>The Max Conducted Peak Output Power: data refer to the report EED32L00168901 |
| Sample Received Date:                                                                                                                                                                                                                                                                                                                                                                                                                                              | Jun, 27, 2019                                                                            |
| Sample tested Date:                                                                                                                                                                                                                                                                                                                                                                                                                                                | Jun, 27, 2019 to Jul. 29, 2019                                                           |
| <p>The tested sample(s) and the sample information are provided by the client.</p> <p>Model No:BTW-V1, BTW-105Q, BTW-106Q, BTW-107Q</p> <p>Only the model BTW-V2 was tested, The add model and original model , electrical circuit design, layout, components used and internal wiring are identical,only model name is different.</p> <p>For the left earphone and right earphone ,electrical circuit design ,PCB Layout is same ,only the cars is different.</p> |                                                                                          |

#### **4.4 Test Location**

All tests were performed at:

Centre Testing International Group Co., Ltd

Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China

Telephone: +86 (0) 755 33683668 Fax: +86 (0) 755 33683385

No tests were sub-contracted.

FCC Designation No.: CN1164

#### **4.5 Deviation from Standards**

None.

#### **4.6 Abnormalities from Standard Conditions**

None.

#### **4.7 Other Information Requested by the Customer**

None.

## 5 RF Exposure Evaluation

### 5.1 RF Exposure Compliance Requirement

#### 5.1.1 Limits

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

| Frequency range<br>(MHz)                                       | Electric field<br>strength<br>(V/m) | Magnetic field<br>strength<br>(A/m) | Power density<br>(mW/cm <sup>2</sup> ) | Averaging time<br>(minutes) |
|----------------------------------------------------------------|-------------------------------------|-------------------------------------|----------------------------------------|-----------------------------|
| <b>(A) Limits for Occupational/Controlled Exposures</b>        |                                     |                                     |                                        |                             |
| 0.3–3.0 .....                                                  | 614                                 | 1.63                                | *(100)                                 | 6                           |
| 3.0–30 .....                                                   | 1842/f                              | 4.89/f                              | *(900/f <sup>2</sup> )                 | 6                           |
| 30–300 .....                                                   | 61.4                                | 0.163                               | 1.0                                    | 6                           |
| 300–1500 .....                                                 | .....                               | .....                               | f/300                                  | 6                           |
| 1500–100,000 .....                                             | .....                               | .....                               | 5                                      | 6                           |
| <b>(B) Limits for General Population/Uncontrolled Exposure</b> |                                     |                                     |                                        |                             |
| 0.3–1.34 .....                                                 | 614                                 | 1.63                                | *(100)                                 | 30                          |
| 1.34–30 .....                                                  | 824/f                               | 2.19/f                              | *(180/f <sup>2</sup> )                 | 30                          |
| 30–300 .....                                                   | 27.5                                | 0.073                               | 0.2                                    | 30                          |
| 300–1500 .....                                                 | .....                               | .....                               | f/1500                                 | 30                          |
| 1500–100,000 .....                                             | .....                               | .....                               | 1.0                                    | 30                          |

A rough estimation of the expected exposure in power flux density on a given point can be made with the following equation:

$$S = \frac{P \times G}{4 \times \pi \times R^2}$$

Where:

S = power density

P = power input to the antenna

G = numeric gain of the antenna in the direction of interest relative to an isotropic radiator

R= distance to the centre of radiation of the antenna

EIRP = P\*G

The antenna of the product, under normal use condition is at least 20 cm away from the body of the user.

Warning statement to the user for keeping at least 20cm separation distance and the prohibition of operating to a person has been printed on the user's manual. Therefore, the S of the device is calculated with R=20cm, and if it is below the limit S, then we can conclude the device complies with the rules.

#### 5.1.2 Test Procedure

Software provided by client enabled the EUT to transmit data at lowest, middle and highest channel individually.

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### 5.1.3 EUT RF Exposure Evaluation

**Antenna Gain:** 4.97dBi

Output Power Into Antenna & RF Exposure Evaluation Distance:

| Channel | Frequency<br>(MHz) | Max Conducted<br>Peak Output<br>Power(dBm) | Gain<br>(dBi) | EIRP*<br>(dBm) | EIRP<br>(mW) | R<br>(cm) | S<br>(mW/cm <sup>2</sup> ) | Limit<br>(mW/cm <sup>2</sup> ) | Result |
|---------|--------------------|--------------------------------------------|---------------|----------------|--------------|-----------|----------------------------|--------------------------------|--------|
| Highest | 2480               | 4.753                                      | 4.97          | 9.723          | 9.38         | 20        | 0.0093                     | 1.0                            | Pass   |

**Note:** Refer to report No. EED32L00168901 for EUT test Max Conducted Peak Output Power value.

## PHOTOGRAPHS OF EUT Constructional Details

Refer to Report No. EED32I00168901 for EUT external and internal photos.

\*\*\* End of Report \*\*\*

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