



## Shenzhen Huaxia Testing Technology Co., Ltd.

SHENZHEN HUAXIA TESTING TECHNOLOGY CO., LTD 102A, 102B, Building 2, Shanghenglang New Industrial Zone, Shanghenglang Community, Dalang Street, Longhua District, Shenzhen, Guangdong, People's Republic of China, 518000

Telephone: +86-755-26648640

Fax: +86-755-26648637

Website: [www.cqa-cert.com](http://www.cqa-cert.com)

Report Template Version: V05

Report Template Revision Date: 2021-11-03



中国认可  
国际互认  
检测  
TESTING  
CNAS L5785

# RF Exposure Evaluation Report

**Report No.:** CQASZ20260701393E-03  
**Applicant:** Ultimea Technology (Shenzhen) Limited  
**Address of Applicant:** 20th Floor, Building 4, Tianan Cloud Park, Bantian St., Longgang District, Shenzhen, China  
**Equipment Under Test (EUT):**  
**EUT Name:** Active Subwoofer  
**Model No.:** U412F, U412E, U512Q, U512R, U512S  
**Test Model No.:** U412F  
**Brand Name:** ULTIMEA  
**FCC ID:** 2A900-U412FB  
**Standards:** 47 CFR Part 1.1307  
47 CFR Part 1.1310  
KDB447498 D01 General RF Exposure Guidance v06  
**Date of Receipt:** 2026-07-01  
**Date of Test:** 2026-07-01 to 2026-08-05  
**Date of Issue:** 2026-9-5  
**Test Result:** PASS\*

\*In the configuration tested, the EUT complied with the standards specified above

**Tested By:** Azir Wang  
( Azir Wang )

**Reviewed By:** Timo Lei  
( Timo Lei )

**Approved By:** Jack Ai  
( Jack Ai )



## 1 Version

### Revision History Of Report

| Report No.           | Version | Description    | Issue Date |
|----------------------|---------|----------------|------------|
| CQASZ20260701393E-03 | Rev.01  | Initial report | 2026-9-5   |

## 2 Contents

|                                              | Page |
|----------------------------------------------|------|
| 1 VERSION .....                              | 2    |
| 2 CONTENTS .....                             | 3    |
| .....                                        | 3    |
| 3 GENERAL INFORMATION .....                  | 4    |
| 3.1 CLIENT INFORMATION .....                 | 4    |
| 3.2 GENERAL DESCRIPTION OF EUT .....         | 4    |
| 3.3 GENERAL DESCRIPTION OF BT CLASSIC .....  | 5    |
| 3.4 GENERAL DESCRIPTION OF BLE .....         | 5    |
| 4 MPE EVALUATION .....                       | 6    |
| 4.1 RF EXPOSURE COMPLIANCE REQUIREMENT ..... | 6    |
| 4.1.1 Limits .....                           | 6    |
| 4.1.2 Test Procedure .....                   | 6    |
| 4.1.3 EUT RF Exposure .....                  | 7    |

### 3 General Information

#### 3.1 Client Information

|                          |                                                                                            |
|--------------------------|--------------------------------------------------------------------------------------------|
| Applicant:               | Ultimea Technology (Shenzhen) Limited                                                      |
| Address of Applicant:    | 20th Floor, Building 4, Tianan Cloud Park, Bantian St., Longgang District, Shenzhen, China |
| Manufacturer:            | Ultimea Technology (Shenzhen) Limited                                                      |
| Address of Manufacturer: | 20th Floor, Building 4, Tianan Cloud Park, Bantian St., Longgang District, Shenzhen, China |
| Factory:                 | Zhong Shan City Richsound Electronic Industrial Ltd.                                       |
| Address of Factory:      | No 16, East ShaGang Road, GangKou Town, ZhongShan City, Guangdong, 528447, China           |

#### 3.2 General Description of EUT

|                   |                                   |
|-------------------|-----------------------------------|
| Product Name:     | Active Subwoofer                  |
| Model No.:        | U412F, U412E, U512Q, U512R, U512S |
| Test Model No.:   | U412F                             |
| Trade Mark:       | ULTIMEA                           |
| Software Version: | 0.1                               |
| Hardware Version: | 0.2                               |
| EUT Power Supply: | Power supply AC 120V              |

### 3.3 General Description of BT Classic

|                       |                                                                              |
|-----------------------|------------------------------------------------------------------------------|
| Operation Frequency:  | 2402MHz~2480MHz                                                              |
| Bluetooth Version:    | Bluetooth Spec 6.0                                                           |
| Modulation Technique: | Frequency Hopping Spread Spectrum(FHSS)                                      |
| Modulation Type:      | GFSK, $\pi/4$ DQPSK, 8DPSK                                                   |
| Number of Channel:    | 79                                                                           |
| Transfer Rate:        | 1Mbps/2Mbps/3Mbps                                                            |
| Hopping Channel Type: | Adaptive Frequency Hopping systems                                           |
| Sample Type:          | <input checked="" type="checkbox"/> Mobile <input type="checkbox"/> Portable |
| Antenna Type:         | PCB antenna                                                                  |
| Antenna Gain:         | 0.64dBi                                                                      |

### 3.4 General Description of BLE

|                       |                                                                                                                    |
|-----------------------|--------------------------------------------------------------------------------------------------------------------|
| Operation Frequency:  | 2402MHz~2480MHz                                                                                                    |
| Bluetooth Version:    | Bluetooth Spec 6.0                                                                                                 |
| Modulation Technique: | Non-Frequency Hopping Spread Spectrum(NFHSS)                                                                       |
| Modulation Type:      | GFSK                                                                                                               |
| Number of Channel:    | 40                                                                                                                 |
| Transfer Rate:        | 1Mbps                                                                                                              |
| Sample Type:          | <input checked="" type="checkbox"/> Mobile <input type="checkbox"/> Portable <input type="checkbox"/> Fix Location |
| Antenna Type:         | PCB antenna                                                                                                        |
| Antenna Gain:         | 0.64dBi                                                                                                            |

Note:

The above parameters will directly affect the test results. The information is provided by the applicant.

## 4 MPE Evaluation

### 4.1 RF Exposure Compliance Requirement

#### 4.1.1 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                          |

F= Frequency in MHz

Friis Formula

Friis transmission formula:  $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = gain of antenna in linear scale

$\pi$  = 3.1416

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

$P_d$  is the limit of MPE, 1 mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

#### 4.1.2 Test Procedure

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

#### 4.1.3 EUT RF Exposure

##### 1) For BLE

Antenna Gain: 0.64dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.16 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

##### Measurement Data

| GFSK mode        |                            |                            |                       |      |
|------------------|----------------------------|----------------------------|-----------------------|------|
| Test channel     | Peak Output Power<br>(dBm) | Tune up tolerance<br>(dBm) | Maximum tune-up Power |      |
|                  |                            |                            | (dBm)                 | (mW) |
| Lowest(2402MHz)  | 3.56                       | $3.5 \pm 1$                | 4.5                   | 2.82 |
| Middle(2440MHz)  | 4.29                       | $4.5 \pm 1$                | 5.5                   | 3.55 |
| Highest(2480MHz) | 2.36                       | $2.5 \pm 1$                | 3.5                   | 2.24 |

The worst case:

| Maximum tune-up Power<br>(mW) | Antenna Gain<br>(dBi) | Power Density<br>at R = 20 cm<br>(mW/cm <sup>2</sup> ) | Limit | Result |
|-------------------------------|-----------------------|--------------------------------------------------------|-------|--------|
| 3.55                          | 0.64                  | 0.0008183847                                           | 1.0   | PASS   |

Note: 1) Refer to report No. CQASZ20250100185E-02 for EUT test Max Conducted Peak Output Power value.

2)  $P_d = (P_{out} * G) / (4 * \pi * R^2) = (3.55 * 1.16) / (4 * 3.1416 * 20^2) = 0.0008183847$

## 2) For BT

Antenna Gain: 0.64dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.16 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

### Measurement Data

| 8DQPSK mode      |                            |                            |                       |      |
|------------------|----------------------------|----------------------------|-----------------------|------|
| Test channel     | Peak Output Power<br>(dBm) | Tune up tolerance<br>(dBm) | Maximum tune-up Power |      |
|                  |                            |                            | (dBm)                 | (mW) |
| Lowest(2402MHz)  | 5.30                       | 5.5±1                      | 6.5                   | 4.47 |
| Middle(2440MHz)  | 7.08                       | 7.0±1                      | 8.0                   | 6.31 |
| Highest(2480MHz) | 6.14                       | 6.5±1                      | 7.5                   | 5.62 |

The worst case:

| Maximum tune-up Power<br>(mW) | Antenna Gain<br>(dBi) | Power Density<br>at R = 20 cm<br>(mW/cm <sup>2</sup> ) | Limit | Result |
|-------------------------------|-----------------------|--------------------------------------------------------|-------|--------|
| 6.31                          | 0.64                  | 0.0014546499                                           | 1.0   | PASS   |

Note: 1) Refer to report No. CQASZ20250100185E-01 for EUT test Max Conducted Peak Output Power value.

2)  $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2) = (6.31 \cdot 1.16) / (4 \cdot 3.1416 \cdot 20^2) = 0.0014546499$

\*\*\* END OF REPORT \*\*\*