



## Shenzhen Huaxia Testing Technology Co., Ltd

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

Telephone: +86-755-26648640

Fax: +86-755-26648637

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

Report Template Version: V04

Report Template Revision Date: 2018-07-06

# RF Exposure Evaluation Report

**Report No.:** CQASZ20250300632E-04  
**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:** Soundbar  
**Model No.:** U4122, U4123, U4121, U4124, U4125  
**Test Model No.:** U4122  
**Brand Name:** ULTIMEA  
**FCC ID:** 2A9OO-U4122S  
**Standards:** 47 CFR Part 1.1307  
47 CFR Part 1.1310  
KDB447498 D01 General RF Exposure Guidance v06  
**Date of Receipt:** 2025-03-24  
**Date of Test:** 2025-03-24 to 2025-04-22  
**Date of Issue:** 2025-5-6  
**Test Result:** **PASS\***

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

**Tested By:** Lewis Zhou  
( Lewis Zhou )

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

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



## 1 Version

### Revision History Of Report

| Report No.           | Version | Description    | Issue Date |
|----------------------|---------|----------------|------------|
| CQASZ20250300632E-04 | Rev.01  | Initial report | 2025-5-6   |

## 2 Contents

|                                              | Page |
|----------------------------------------------|------|
| 1 VERSION .....                              | 2    |
| 2 CONTENTS .....                             | 3    |
| 3 GENERAL INFORMATION .....                  | 4    |
| 3.1 CLIENT INFORMATION .....                 | 4    |
| 3.2 GENERAL DESCRIPTION OF EUT .....         | 4    |
| 3.3 GENERAL DESCRIPTION OF BLE .....         | 5    |
| 3.4 GENERAL DESCRIPTION OF BT .....          | 5    |
| 3.5 GENERAL DESCRIPTION OF BT .....          | 5    |
| 4 RF EXPOSURE EVALUATION .....               | 6    |
| 4.1 RF EXPOSURE COMPLIANCE REQUIREMENT ..... | 6    |
| 4.1.1 Limits .....                           | 6    |
| 4.1.2 Test Procedure .....                   | 6    |
| 4.2 1.1.3 EUT RF EXPOSURE EVALUATION .....   | 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:                 | Guangzhou Panyu Juda Car Audio Equipment Co., Ltd                                                                  |
| Address of Factory:      | NO.5 Building, No.139, Zhouxing Street, Dongchong Town, Nansha District, Guangzhou City, Guangdong Province, China |

#### 3.2 General Description of EUT

|                           |                                                                                                                                                              |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Name:             | Soundbar                                                                                                                                                     |
| Model No.:                | U4122, U4123, U4121, U4124, U4125                                                                                                                            |
| Test Model No.:           | U4122                                                                                                                                                        |
| Trade Mark:               | ULTIMEA                                                                                                                                                      |
| Software Version:         | 77                                                                                                                                                           |
| Hardware Version:         | V1.2                                                                                                                                                         |
| EUT Power Supply:         | Model:FX65C-240300Z<br>Input:100-240V~50/60Hz 2A<br>Output:24V 3.0A                                                                                          |
|                           | Model:GQ72A-240300-AU<br>Input:100-240V~50/60Hz 2A<br>Output:24V 3.0A                                                                                        |
| Simultaneous Transmission | <input checked="" type="checkbox"/> Simultaneous TX is supported and evaluated in this report.<br><input type="checkbox"/> Simultaneous TX is not supported. |

### 3.3 General Description of BLE

|                      |                                                                              |
|----------------------|------------------------------------------------------------------------------|
| Operation Frequency: | 2402MHz~2480MHz                                                              |
| Bluetooth Version:   | 5.3                                                                          |
| Module information:  | ATS2853                                                                      |
| Modulation Type:     | GFSK                                                                         |
| Transfer Rate:       | 1Mbps/2Mbps                                                                  |
| Number of Channel:   | 40                                                                           |
| Sample Type:         | <input checked="" type="checkbox"/> Mobile <input type="checkbox"/> Portable |
| Antenna Type:        | PCB antenna                                                                  |
| Antenna Gain:        | 3.28dBi                                                                      |

### 3.4 General Description of BT

|                      |                                                                              |
|----------------------|------------------------------------------------------------------------------|
| Operation Frequency: | 2402MHz~2480MHz                                                              |
| Bluetooth Version:   | 5.3                                                                          |
| Module information:  | ATS2853                                                                      |
| Modulation Type:     | GFSK, $\pi/4$ DQPSK, 8DPSK                                                   |
| Transfer Rate:       | 1Mbps/2Mbps/3Mbps                                                            |
| Number of Channel:   | 79                                                                           |
| Sample Type:         | <input checked="" type="checkbox"/> Mobile <input type="checkbox"/> Portable |
| Antenna Type:        | PCB antenna                                                                  |
| Antenna Gain:        | 3.28dBi                                                                      |

### 3.5 General Description of BT

|                      |                                                                              |
|----------------------|------------------------------------------------------------------------------|
| Operation Frequency: | 2402MHz~2480MHz                                                              |
| Bluetooth Version:   | 5.3                                                                          |
| Module information:  | ATS2835P                                                                     |
| Modulation Type:     | GFSK, $\pi/4$ DQPSK, 8DPSK                                                   |
| Transfer Rate:       | 1Mbps/2Mbps/3Mbps                                                            |
| Number of Channel:   | 79                                                                           |
| Sample Type:         | <input checked="" type="checkbox"/> Mobile <input type="checkbox"/> Portable |
| Antenna Type:        | FPC antenna                                                                  |
| Antenna Gain:        | 4.36dBi                                                                      |

## 4 RF Exposure 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.

## 4.2 1.1.3 EUT RF Exposure Evaluation

### 1) For BLE (ATS2853)

Antenna Gain: 3.28dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.13 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)  | 7.14                       | $7 \pm 1$                  | 8                     | 6.310 |
| Middle(2440MHz)  | 7.48                       | $7.5 \pm 1$                | 8.5                   | 7.079 |
| Highest(2480MHz) | 7.23                       | $7.5 \pm 1$                | 8.5                   | 7.079 |

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 |
|-------------------------------|-----------------------|--------------------------------------------------------|-------|--------|
| 7.079                         | 3.28                  | 0.000299729                                            | 1.0   | PASS   |

Note: 1) Refer to report No. CQASZ20250300632E-01 for EUT test Max Conducted Peak Output Power value.

2)  $P_d = (P_{out} * G) / (4 * \pi * R^2) = (7.079 * 2.13) / (4 * 3.1416 * 20^2) = 0.000299729$

## 2) For BT (ATS2853)

Antenna Gain: 3.28dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.13 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)  | 8.98                       | 9±1                        | 10                    | 10.000 |
| Middle(2441MHz)  | 8.77                       | 9±1                        | 10                    | 10.000 |
| Highest(2480MHz) | 8.95                       | 9±1                        | 10                    | 10.000 |
| π/4DQPSK mode    |                            |                            |                       |        |
| Test channel     | Peak Output Power<br>(dBm) | Tune up tolerance<br>(dBm) | Maximum tune-up Power |        |
|                  |                            |                            | (dBm)                 | (mW)   |
| Lowest(2402MHz)  | 9.24                       | 9.5±1                      | 10.5                  | 11.220 |
| Middle(2441MHz)  | 9.01                       | 9±1                        | 10                    | 10.000 |
| Highest(2480MHz) | 9.49                       | 9.5±1                      | 10.5                  | 11.220 |
| 8DPSK mode       |                            |                            |                       |        |
| Test channel     | Peak Output Power<br>(dBm) | Tune up tolerance<br>(dBm) | Maximum tune-up Power |        |
|                  |                            |                            | (dBm)                 | (mW)   |
| Lowest(2402MHz)  | 9.73                       | 10±1                       | 11                    | 12.589 |
| Middle(2441MHz)  | 9.35                       | 9.5±1                      | 10.5                  | 11.220 |
| Highest(2480MHz) | 9.75                       | 10±1                       | 11                    | 12.589 |

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 |
|-------------------------------|-----------------------|--------------------------------------------------------|-------|--------|
| 12.589                        | 3.28                  | 0.00533                                                | 1.0   | PASS   |

Note: 1) Refer to report No. CQASZ20250300632E-02 for EUT test Max Conducted Peak Output Power value.

2)  $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2) = (12.589 \cdot 2.13) / (4 \cdot 3.1416 \cdot 20^2) = 0.00533$



### 3) For BT (ATS2835P)

Antenna Gain: 4.36dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.73 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)  | 7.07                       | 7±1                        | 8                     | 6.310 |
| Middle(2441MHz)  | 7.16                       | 7±1                        | 8                     | 6.310 |
| Highest(2480MHz) | 7.26                       | 7.5±1                      | 8.5                   | 7.079 |
| π/4DQPSK mode    |                            |                            |                       |       |
| Test channel     | Peak Output Power<br>(dBm) | Tune up tolerance<br>(dBm) | Maximum tune-up Power |       |
|                  |                            |                            | (dBm)                 | (mW)  |
| Lowest(2402MHz)  | 6.89                       | 7±1                        | 8                     | 6.310 |
| Middle(2441MHz)  | 6.92                       | 7±1                        | 8                     | 6.310 |
| Highest(2480MHz) | 7.06                       | 7±1                        | 8                     | 6.310 |
| 8DPSK mode       |                            |                            |                       |       |
| Test channel     | Peak Output Power<br>(dBm) | Tune up tolerance<br>(dBm) | Maximum tune-up Power |       |
|                  |                            |                            | (dBm)                 | (mW)  |
| Lowest(2402MHz)  | 7.14                       | 7±1                        | 8                     | 6.310 |
| Middle(2441MHz)  | 7.26                       | 7.5±1                      | 8.5                   | 7.079 |
| Highest(2480MHz) | 7.24                       | 7.5±1                      | 8.5                   | 7.079 |

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 |
|-------------------------------|-----------------------|--------------------------------------------------------|-------|--------|
| 7.079                         | 4.36                  | 0.0038435                                              | 1.0   | PASS   |

Note: 1) Refer to report No. CQASZ20250300632E-03 for EUT test Max Conducted Peak Output Power value.

2)  $P_d = (P_{out} * G) / (4 * \pi * R^2) = (2.73 * 2.73) / (4 * 3.1416 * 20^2) = 0.0038435$

**Simultaneous TX:**

$\text{BLE(ATS2853)} + \text{BT(ATS2853)} + \text{BT(ATS2835P)} \leq 1$

$0.000299729 + 0.00533 + 0.0038435 \leq 1$

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