



## 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)

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# RF Exposure Evaluation Report

**Report No.:** CQASZ20241002229E-02  
**Applicant:** Shenzhen Kingstar Industrial Co.,Ltd.  
**Address of Applicant:** Room 211, Min Le technology Building Meiban Road, LongHua District, Shenzhen, China  
**Equipment Under Test (EUT):**  
**EUT Name:** LIVE TWS EARBUDS WITH POWER DISPLAY  
**Model No.:** 941454  
**Test Model No.:** 941454  
**Brand Name:** N/A  
**FCC ID:** 2AO47-KS941454  
**Standards:** 47 CFR Part 1.1307  
47 CFR Part 2.1093  
KDB447498 D04 Interim General RF Exposure Guidance v01  
**Date of Receipt:** 2024-10-18  
**Date of Test:** 2024-10-18 to 2024-10-28  
**Date of Issue:** 2024-11-21  
**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:** Alex  
( Alex Wang )



## 1 Version

### Revision History Of Report

| Report No.           | Version | Description    | Issue Date |
|----------------------|---------|----------------|------------|
| CQASZ20241002229E-02 | Rev.01  | Initial report | 2024-11-21 |

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### 3 General Information

#### 3.1 Client Information

|                          |                                                                                     |
|--------------------------|-------------------------------------------------------------------------------------|
| Applicant:               | Shenzhen Kingstar Industrial Co.,Ltd.                                               |
| Address of Applicant:    | Room 211, Min Le technology Building Meiban Road, LongHua District, Shenzhen, China |
| Manufacturer:            | Shenzhen Kingstar Industrial Co.,Ltd.                                               |
| Address of Manufacturer: | Room 211, Min Le technology Building Meiban Road, LongHua District, Shenzhen, China |
| Factory:                 | Shenzhen Kingstar Industrial Co.,Ltd.                                               |
| Address of Factory:      | Room 211, Min Le technology Building Meiban Road, LongHua District, Shenzhen, China |

#### 3.2 General Description of EUT

|                   |                                                              |
|-------------------|--------------------------------------------------------------|
| Product Name:     | LIVE TWS EARBUDS WITH POWER DISPLAY                          |
| Model No.:        | 941454                                                       |
| Test Model No.:   | 941454                                                       |
| Trade Mark:       | N/A                                                          |
| Software Version: | V5.3                                                         |
| Hardware Version: | V5.3                                                         |
| Power Supply:     | Li-ion battery DC 3.7V 30mAh, Charge by DC 5V for Charge box |

#### 3.3 General Description of BT

|                      |                                                                              |
|----------------------|------------------------------------------------------------------------------|
| Operation Frequency: | 2402MHz~2480MHz                                                              |
| Modulation Type:     | GFSK, $\pi/4$ DQPSK, 8DPSK                                                   |
| Transfer Rate:       | 1Mbps/2Mbps/3Mbps                                                            |
| Number of Channel:   | 79                                                                           |
| Product Type:        | <input type="checkbox"/> Mobile <input checked="" type="checkbox"/> Portable |
| Antenna Type:        | Chip antenna                                                                 |
| Antenna Gain:        | 2.6dBi                                                                       |

## 4 SAR Evaluation

### 4.1 RF Exposure Compliance Requirement

#### 4.1.1 Standard Requirement

447498 D04 Interim General RF Exposure Guidance v01

##### 3.2. SAR Test Reduction Guidance

SAR test reduction procedures [Glossary] allow using a particular set of test data as representative of other, similar, test conditions. This may be applied for data within different test positions (e.g. body, head, extremity), wireless modes (e.g. Wi-Fi, cellular), and frequency bands. This test reduction process provides for the use of test data for one specific channel, while referencing to those data for demonstrating compliance in other required channels for each test position of an exposure condition, within the operating mode of a frequency band. This is limited specifically to when the reported 1-g or 10-g SAR for the mid-band or highest output power channel meets any of the following conditions.

#### 4.1.2 Limits

SAR-based thresholds are derived based on frequency, power, and separation distance of the RF source. The formula defines the thresholds in general for either available maximum time-averaged power or maximum time-averaged ERP, whichever is greater.

If the ERP of a device is not easily determined, such as for a portable device with a small form factor, the applicant may use the available maximum time-averaged power exclusively if the device antenna or radiating structure does not exceed an electrical length of  $\lambda/4$ .

As for devices with antennas of length greater than  $\lambda/4$  where the gain is not well defined, but always less than that of a half-wave dipole (length  $\lambda/2$ ), the available maximum time-averaged power generated by the device may be used in place of the maximum time-averaged ERP, where that value is not known.

The separation distance is the smallest distance from any part of the antenna or radiating structure for all persons, during operation at the applicable ERP. In the case of mobile or portable devices, the separation distance is from the outer housing of the device where it is closest to the antenna.

The SAR-based exemption formula of § 1.1307(b)(3)(i)(B), repeated here as Formula (B.2), applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold  $P_{th}$  (mW).

This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive).  $P_{th}$  is given by Formula (B.2).

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases} \quad (\text{B.2})$$

where

$$x = -\log_{10} \left( \frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right)$$

and  $f$  is in GHz,  $d$  is the separation distance (cm), and  $ERP_{20 \text{ cm}}$  is per Formula (B.1).  
The example values shown in Table B.2 are for illustration only.

Table B.2—Example Power Thresholds (mW)

| Frequency (MHz) | Distance (mm) |    |    |     |     |     |     |     |     |     |
|-----------------|---------------|----|----|-----|-----|-----|-----|-----|-----|-----|
|                 | 5             | 10 | 15 | 20  | 25  | 30  | 35  | 40  | 45  | 50  |
| 300             | 39            | 65 | 88 | 110 | 129 | 148 | 166 | 184 | 201 | 217 |
| 450             | 22            | 44 | 67 | 89  | 112 | 135 | 158 | 180 | 203 | 226 |
| 835             | 9             | 25 | 44 | 66  | 90  | 116 | 145 | 175 | 207 | 240 |
| 1900            | 3             | 12 | 26 | 44  | 66  | 92  | 122 | 157 | 195 | 236 |
| 2450            | 3             | 10 | 22 | 38  | 59  | 83  | 111 | 143 | 179 | 219 |
| 3600            | 2             | 8  | 18 | 32  | 49  | 71  | 96  | 125 | 158 | 195 |
| 5800            | 1             | 6  | 14 | 25  | 40  | 58  | 80  | 106 | 136 | 169 |

#### 4.1.3 EUT RF Exposure

##### 1) For BT

##### Measurement Data

| Channel           | Conducted Peak Output Power (dBm) | EIRP (dBm) | Maximum tune-up Power (mW) | Exclusion threshold (mW) |
|-------------------|-----------------------------------|------------|----------------------------|--------------------------|
| Lowest (2402MHz)  | -2.47                             | -0.41      | 0.910                      | 3.0                      |
| Middle (2441MHz)  | -2.04                             | 0.02       | 1.005                      |                          |
| Highest (2480MHz) | -0.6                              | 1.46       | 1.400                      |                          |

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20241002229E-01

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