



# RF EXPOSURE EXEMPT REPORT

**APPLICANT** : Shenzhen Airmart Technology Co., Ltd.  
**PRODUCT NAME** : BUTTON PORTABLE BLUETOOTH SPEAKER  
**MODEL NAME** : MW-P1I , MW-P1S  
**BRAND NAME** : MUZEN  
**FCC ID** : 2ALXL-P1  
**STANDARD(S)** : 47CFR 2.1093  
KDB 447498  
**RECEIPT DATE** : 2019-02-28  
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| Change History |            |                   |
|----------------|------------|-------------------|
| Version        | Date       | Reason for change |
| 1.0            | 2019-03-18 | First edition     |
|                |            |                   |
|                |            |                   |
|                |            |                   |



# 1. Technical Information

**Note:** Provide by Applicant.

## 1.1 Applicant and Manufacturer Information

|                              |                                                                                                                      |
|------------------------------|----------------------------------------------------------------------------------------------------------------------|
| <b>Applicant:</b>            | Shenzhen Airmart Technology Co., Ltd.                                                                                |
| <b>Applicant Address:</b>    | Unit 616,Ant's Union Start-up Accelerator,No.9 Keji Road,Science and Technology Park,Nanshan District Shenzhen China |
| <b>Manufacturer:</b>         | Shenzhen Airmart Technology Co., Ltd.                                                                                |
| <b>Manufacturer Address:</b> | Unit 616,Ant's Union Start-up Accelerator,No.9 Keji Road,Science and Technology Park,Nanshan District Shenzhen China |

## 1.2 Equipment Under Test (EUT) Description

|                          |                                                                      |
|--------------------------|----------------------------------------------------------------------|
| <b>EUT Type:</b>         | BUTTON PORTABLE BLUETOOTH SPEAKER                                    |
| <b>Hardware Version:</b> | A/I                                                                  |
| <b>Software Version:</b> | 1.0                                                                  |
| <b>Frequency Bands:</b>  | Bluetooth: 2402MHz-2480MHz                                           |
| <b>Modulation Mode:</b>  | Bluetooth BR+EDR: GFSK, $\pi/4$ -DQPSK, 8-DPSK<br>Bluetooth LE: GFSK |
| <b>Antenna Type:</b>     | FPC Antenna                                                          |
| <b>Antenna Gain:</b>     | 2.01dBi                                                              |

**Note:** The model MW-P1I and MW-P1S are accordant in both hardware and software, only differ in model number.



### 1.3 Identification of all used EUT

The EUT identity consists of numerical and letter characters, the letter character indicates the test sample, and the following two numerical characters indicate the software version of the test sample.

| EUT Identity | Hardware Version | Software Version |
|--------------|------------------|------------------|
| 1#           | A/I              | 1.0              |

### 1.4 Applied Reference Documents

Leading reference documents for testing:

| No. | Identity          | Document Title                                                  |
|-----|-------------------|-----------------------------------------------------------------|
| 1   | 47 CFR§2.1093     | Radio Frequency Radiation Exposure Evaluation: portable devices |
| 2   | KDB 447498 D01v06 | General RF Exposure Guidance                                    |



## 2. Device Category and RF Exposure Limit

Per user manual, this device is BUTTON PORTABLE BLUETOOTH SPEAKER. Based on 47CFR 2.1093, this device belongs to portable device category with General Population/Uncontrolled exposure.

### **Portable Devices:**

47CFR 2.1093(b)

For purposes of this section, a portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user.

### **GENERAL POPULATION / UNCONTROLLED EXPOSURE**

47CFR 2.1093(d) (2)

Limits for General Population/Uncontrolled exposure: 0.08 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 1.6 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 4 W/kg, as averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). General Population/Uncontrolled limits apply when the general public may be exposed, or when persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or do not exercise control over their exposure. Warning labels placed on consumer devices such as cellular telephones will not be sufficient reason to allow these devices to be evaluated subject to limits for occupational/controlled exposure in paragraph (d)(1) of this section.

### 3. Measurement of RF Output Power

#### 1. Bluetooth output power

| Mode                | Channel | Frequency<br>(MHz) | Peak power (dBm) |       |             |
|---------------------|---------|--------------------|------------------|-------|-------------|
|                     |         |                    | 1Mbps            | 2Mbps | 3Mbps       |
| BR / EDR            | CH 00   | 2402               | -0.76            | 0.45  | <b>0.92</b> |
|                     | CH 39   | 2441               | -1.50            | -0.23 | 0.27        |
|                     | CH 78   | 2480               | -2.13            | -0.83 | -0.35       |
| Tune-up Limit (dBm) |         |                    | -0.50            | 1.00  | 1.00        |

| Mode                | Channel | Frequency<br>(MHz) | Peak power (dBm) |
|---------------------|---------|--------------------|------------------|
|                     |         |                    | GFSK             |
| LE                  | CH 00   | 2402               | <b>3.17</b>      |
|                     | CH 19   | 2440               | 2.88             |
|                     | CH 39   | 2480               | 2.44             |
| Tune-up Limit (dBm) |         |                    | 4.00             |

**Note:** According to KDB 447498 Section 4.3, SAR test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.



## 4. RF Exposure Evaluation

The device only incorporates a BUTTON PORTABLE BLUETOOTH SPEAKER so standalone SAR evaluation is required for Bluetooth and simultaneous SAR is not required.

Standalone transmission SAR evaluation

According to KDB 447498 section 4.3.1, the 1-g SAR test exclusion thresholds at test separation Distances  $\leq 50$  mm are determined by:

$$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$$

The maximum tune-up limit power is **2.51mW @ 2.402GHz**

The BUTTON PORTABLE BLUETOOTH SPEAKER is used on the hand/head, so use **5mm** as the most conservative minimum test separation distance,

$$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] = 0.78 \leq 3.0$$

So SAR evaluation is not required for this device.

**Note:** Declaration of the tune-up limit is **4.00dBm**.



## Annex A General Information

### 1. Identification of the Responsible Testing Laboratory

|                     |                                                                                                                                  |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Laboratory Name:    | Shenzhen Morlab Communications Technology Co., Ltd.Morlab Laboratory                                                             |
| Laboratory Address: | FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, Guangdong Province, P. R. China |
| Telephone:          | +86 755 36698555                                                                                                                 |
| Facsimile:          | +86 755 36698525                                                                                                                 |

### 2. Identification of the Responsible Testing Location

|          |                                                                                                                                  |
|----------|----------------------------------------------------------------------------------------------------------------------------------|
| Name:    | Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory                                                            |
| Address: | FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, Guangdong Province, P. R. China |

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