



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
TEST DATE : 2019-03-07 to 2019-03-12
ISSUE DATE : 2019-03-18

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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

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

EUT Type:	BUTTON PORTABLE BLUETOOTH SPEAKER
Hardware Version:	A/I
Software Version:	1.0
Frequency Bands:	Bluetooth: 2402MHz-2480MHz
Modulation Mode:	Bluetooth BR+EDR: GFSK, $\pi/4$ -DQPSK, 8-DPSK Bluetooth LE: GFSK
Antenna Type:	FPC Antenna
Antenna Gain:	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 (MHz)	Peak power (dBm)		
			1Mbps	2Mbps	3Mbps
BR / EDR	CH 00	2402	-0.76	0.45	0.92
	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 (MHz)	Peak power (dBm)
			GFSK
LE	CH 00	2402	3.17
	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 ≤ 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,

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

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
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2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
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