REPORT No.: SZ23020243S01

RF EXPOSURE

EXEMPT REPORT

APPLICANT	:	Shanghai Zenchant Electronic CO.,LTD.
PRODUCT NAME	:	Dual Bluetooth Module
MODEL NAME	:	ZEN-BDM12A
BRAND NAME	:	ZENCHANT
FCC ID	:	2AOC9-ZENBDM12A
STANDARD(S)	:	47 CFR Part 2(2.1093)
RECEIPT DATE	:	2023-03-01
TEST DATE	:	2023-03-06 to 2023-03-15
ISSUE DATE	:	2023-03-30

Edited by: Zeng Xiaoying (Rapporteur)

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DIRECTORY

Change History		
Version	**Date**	**Reason for change**
1.0	2023-03-30	First edition

1. Technical Information

Note: Provide by applicant.

1.1 Applicant and Manufacturer Information

Applicant:	Shanghai Zenchant Electronic CO.,LTD.
Applicant Address:	Room 1202-1204,Building A,Noble International Center,No.908 xiuwen Road,Minhang District,Shanghai,China
Manufacturer:	Shanghai Zenchant Electronic CO.,LTD.
Manufacturer Address:	Room 1202-1204,Building A,Noble International Center,No.908 xiuwen Road,Minhang District,Shanghai,China

1.2 Equipment Under Test (EUT) Description

Product Name:	Dual Bluetooth Module
Sample No.:	1#
Hardware Version:	V1.0
Software Version:	V1.0
Equipment Type:	Bluetooth
Bluetooth Version:	5.3
Operating Frequency Range:	2402MHz-2480MHz
Modulation Type:	GFSK(1Mbps), π/4-DQPSK(EDR 2Mbps), 8-DPSK(EDR 3Mbps)
Antenna Type:	PCB Antenna
Antenna Gain:	1.6dBi

1.3 Applied Reference Documents

Leading reference documents for testing:

Identity	Document Title	Method Determination /Remark
47 CFR Part 2(2.1093)	Radio Frequency Radiation Exposure Assessment: Portable devices	No deviation
KDB 447498 D01v06	General RF Exposure Guidance	No deviation
Note 1: Additions to, deviation, or exclusions from the method shall be judged in the "method determination" column of add, deviate or exclude from the specific method shall be explained in the "Remark" of the above table. **Note 2:** When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% confidence intervals.		

2. Device Category and RF Exposure Limit

Per user manual, based on 47 CFR 2.1093, this device belongs to portable device category with General Population/Uncontrolled exposure.

Portable Devices:

47 CFR 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:

47 CFR 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. RF Output Power

<Bluetooth Output Power>

Mode	Channel	Frequency (MHz)	Average Power (dBm)
			GFSK
Bluetooth LE (1M)	CH 00	2402	2.89
	CH 19	2440	3.70
	CH 39	2480	3.87
Tune-up Limit			4.00
Bluetooth LE (2M)	CH 00	2402	2.96
	CH 19	2440	3.99
	CH 39	2480	4.10
Tune-up Limit			4.50

Mode	Channel	Frequency (MHz)	Average Power (dBm)		
			1Mbps	2Mbps	3Mbps
Bluetooth classic	CH 00	2402	5.78	4.28	4.55
	CH 39	2441	6.38	5.05	4.85
	CH 78	2480	6.59	4.98	5.23
Tune-up Limit			**7.00**	5.50	5.50

Note 1: According to KDB 447498, 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.

Note 2: The output power refers to report (Report No.: SZ23020243W01/W02).

4. RF Exposure Evaluation

➢ **Standalone Transmission SAR Evaluation:**

1. According to KDB 447498 section 4.3.1, the 1-g SAR test exclusion thresholds at test separation Distances≤ 50 mm are determined by:
   [(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)]·[√f(GHz)] ≤ 3.0.
   · f(GHz) is the RF channel transmit frequency in GHz
   · Power and distance are rounded to the nearest mW and mm before calculation
   · The result is rounded to one decimal place for comparison

2. When the device is used, 5mm as the most conservative minimum test separation distance was used for evaluating.

Channel	Frequency (GHz)	Max. Tune-up Power (dBm)	Max. Power (mW)	Test Distance (mm)	Result	Exclusion Thresholds for 1-g SAR
CH 78	2.480	7.00	5.00	5	1.57	3.0

Note: The conduction power was rounded in mW.

3. When standalone SAR is not required to be measured, per KDB 447498 D01v06 4.3.2), the following equation must be used to estimate the standalone 1g SAR.

$$\text{Estimated SAR} = \frac{\sqrt{f(GHz)}}{7.5} \cdot \frac{\text{Max. power of channel, mW}}{\text{Min. Separation Distance, mm}}$$

Mode	Max. Tune-up Power (dBm)	Exposure Position	Body
		Test Distance (mm)	5
Bluetooth	7.00	Estimated SAR (W/kg)	0.21

➢ **Simultaneous SAR Evaluation:**

This device only incorporates one Bluetooth transmitter, therefore simultaneous SAR evaluation is not required.

Annex A Testing Laboratory Information

1. Identification of the Responsible Testing Laboratory

Laboratory Name:	Shenzhen Morlab Communications Technology Co., Ltd.
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
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2. Identification of the Responsible Testing Location

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

3. Facilities and Accreditations

All measurement facilities used to collect the measurement data are located at FL.3, Building A, FeiYang Science Park, Block 67, BaoAn District, Shenzhen, 518101 P. R. China. The test site is constructed in conformance with the requirements of ANSI C63.10-2013 and CISPR Publication 22; the FCC designation number is CN1192, the test firm registration number is 226174.

END OF REPORT