REPORT No.: SZ22110173S01

RF EXPOSURE

EXEMPT REPORT

APPLICANT	:	Shenzhen Tengfei Technology Management Ltd.
PRODUCT NAME	:	REDMAGIC MECHANICAL KEYBOARD
MODEL NAME	:	GK001J
BRAND NAME	:	REDMAGIC
FCC ID	:	2A9QD-GK001J
STANDARD(S)	:	47 CFR Part 2(2.1093)
RECEIPT DATE	:	2022-11-23
TEST DATE	:	2022-12-07 to 2023-02-02
ISSUE DATE	:	2023-03-14

Edited by: Zeng Xiaoying (Rapporteur)

Approved by: Shen Junsheng (Supervisor)

NOTE: This document is issued by Shenzhen Morlab Communications Technology Co., Ltd., the test report shall not be reproduced except in full without prior written permission of the company. The test results apply only to the particular sample(s) tested and to the specific tests carried out which is available on request for validation and information confirmed at our website.

MORLAB

Shenzhen Morlab Communications Technology Co., Ltd.
FL.1-3, Building A, FeiYang Science Park, No.8 LongChang Road,
Block67, BaoAn District, ShenZhen , GuangDong Province, P. R. China

Tel: 86-755-36698555 Fax: 86-755-36698525
Http://www.morlab.cn E-mail: service@morlab.cn

DIRECTORY

1. Technical Information 3
1.1 Applicant and Manufacturer Information 3
1.2 Equipment Under Test (EUT) Description 3
1.3 Applied Reference Documents 4
2. Device Category and RF Exposure Limit 5
3. RF Output Power 6
4. RF Exposure Evaluation 7
Annex A Testing Laboratory Information 8

Change History		
Version	**Date**	**Reason for change**
1.0	2023-03-14	First edition

1. Technical Information

Note: Provide by applicant.

1.1 Applicant and Manufacturer Information

Applicant:	Shenzhen Tengfei Technology Management Ltd.
Applicant Address:	Room 3101, Building D1, Chuangzhi Yuncheng, Liuxian Avenue, Xili Street, Nanshan, Shenzhen, China
Manufacturer:	Shenzhen Tengfei Technology Management Ltd.
Manufacturer Address:	Room 3101, Building D1, Chuangzhi Yuncheng, Liuxian Avenue, Xili Street, Nanshan, Shenzhen, China

1.2 Equipment Under Test (EUT) Description

Product Name:	REDMAGIC MECHANICAL KEYBOARD
Sample No.:	4#
Hardware Version:	GK001J
Software Version:	GK001J_V1.1.0.35
Operating Frequency Range:	Bluetooth: 2402MHz-2480MHz 2.4G: 2402MHz-2480MHz
Modulation Type:	GFSK
Antenna Type:	PCB Antenna
Antenna Gain:	-5.61dBi

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

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	6.05
	CH 19	2440	6.08
	CH 39	2480	**6.33**
Tune-up Limit			6.50
Bluetooth LE (2M)	CH 00	2402	5.93
	CH 19	2440	5.87
	CH 39	2480	6.07
Tune-up Limit			6.00

<2.4GHz Output Power>

Mode	Channel	Frequency (MHz)	Average Power (dBm)
			GFSK
2.4GHz	CH 1	2402	**0.87**
	CH 5	2440	-1.54
	CH 6	2480	-1.22
Tune-up Limit			1.00

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.: SZ22110173W01/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.

Bands	Frequency (GHz)	Max. Tune-up Power (dBm)	Max. Power (mW)	Test Distance (mm)	Result	Exclusion Thresholds for 1-g SAR
Bluetooth	2.480	6.50	4.00	5	1.26	3.0
2.4GHz	2.402	1.00	1.00	5	0.31	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.

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

Bands	Max. Tune-up Power (dBm)	Exposure Position	Body
		Test Distance (mm)	5
Bluetooth	6.50	Estimated SAR (W/kg)	0.168
2.4GHz	1.00		0.041

➢ **Simultaneous SAR Evaluation:**

According to the user manual, both the 2.4GHz and Bluetooth transmitters in the device cannot operate simultaneously, therefore simultaneous transmission analysis 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
Facsimile:	+86 755 36698525

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