REPORT No.: SZ24030075S01

RF EXPOSURE EVALUATION REPORT

APPLICANT	:	Shenzhen Rayzeek Tech.LTD
PRODUCT NAME	:	Wireless Motion Sensor Controller Kits
MODEL NAME	:	Refer to section 1.2
BRAND NAME	:	Rayzeek
FCC ID	:	2BFMX-RZ016W
STANDARD(S)	:	47 CFR Part 2(2.1091)
RECEIPT DATE	:	2024-03-28
TEST DATE	:	2024-04-09 to 2024-04-12
ISSUE DATE	:	2024-05-15

Edited by: Zeng Xiaoying (Rapporteur)

Approved by: Shen Junsheng (Supervisor)

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DIRECTORY

Change History		
Version	**Date**	**Reason for Change**
1.0	2024-05-15	First edition

1. Technical Information

Note: Provide by applicant.

1.1 Applicant and Manufacturer Information

Applicant:	Shenzhen Rayzeek Tech.LTD
Applicant Address:	522,Building D,Huayuan Innovation Park,Baoyuan Road,Xixiang Street, Bao'an District,Shenzhen,china
Manufacturer:	Shenzhen Bester Tech Ltd
Manufacturer Address:	6F,Building B1,Hengfeng Industrial City,Xixiang,Baoan District, Shenzhen

1.2 Equipment under Test (EUT) Description

Product Name:	Wireless Motion Sensor Controller Kits
Model Name:	RZ016A, RZ016W, RZ016-1A1W, RZ016-1A2W, LED1661A1W, LED1661A1W-2, LED1661A2W, LED1661A2W-2, LED1601A1W, LED1601A1W-2, LED1601A2W, LED1601A2W-2, RZ017A, LED1761A1W, LED1761A1W-2, LED1761A2W, LED1761A2W-2, LED1701A1W, LED1701A1W-2, LED1701A2W, LED1701A2W-2, RZ020A, RZ021A, RZ022A, RZ023A, RZ036A, RZ022W, RZ023W, RZ022WG, RZ023WG, RZ060R, RZ060S, RZ061R, RZ061S, RZ062S, RZ063S, RZ064S, RZ065S
Sample No.:	17#
Hardware Version:	V1.0
Software Version:	V1.0
Operating Frequency:	433.92MHz
Antenna Type:	PCB Antenna
Antenna Gain:	-8.44dBi

Note 1: According to the certificate holder, they declared that the product have these models: RZ016A, RZ016W, RZ016-1A1W, RZ016-1A2W, LED1661A1W, LED1661A1W-2, LED1661A2W, LED1661A2W-2, LED1601A1W, LED1601A1W-2, LED1601A2W, LED1601A2W-2, RZ017A, LED1761A1W, LED1761A1W-2, LED1761A2W, LED1761A2W-2, LED1701A1W, LED1701A1W-2, LED1701A2W, LED1701A2W-2, RZ020A, RZ021A, RZ022A, RZ023A, RZ036A, RZ022W, RZ023W, RZ022WG, RZ023WG, RZ060R, RZ060S, RZ061R, RZ061S, RZ062S, RZ063S, RZ064S, RZ065S

The transmitter models are: RZ016W, RZ022W, RZ023W, RZ022WG, RZ023WG, RZ060S, RZ061S, RZ062S, RZ063S, RZ064S, RZ065S. The transmitting terminal product are the same

products. These models only differ in model name.

The receiving end models are: RZ016A, RZ017A, RZ020A, RZ021A, RZ022A, RZ023A, RZ036A, RZ060R, RZ061R. The receiving terminal product are the same products. These models only differ in model name.

Models that include receiving and transmitting are: RZ016-1A1W, RZ016-1A2W, LED1661A1W, LED1661A1W-2, LED1661A2W, LED1661A2W-2, LED1601A1W, LED1601A1W-2, LED1601A2W, LED1601A2W-2, LED1761A1W, LED1761A1W-2, LED1761A2W, LED1761A2W-2, LED1701A1W, LED1701A1W-2, LED1701A2W, LED1701A2W-2. The receiving end product is the same product, the transmitting end is the same product, they are only different on the model name.

Except for the differences shown above, their electrical circuit design, layout, components used and internal wiring are identical. No other changes.

The main measuring model is RZ016W, only the results for RZ016W were recorded in this report.

1.3 Applied Reference Documents

Leading reference documents for testing:

Identity	Document Title	Method Determination /Remark
47 CFR Part 2 (2.1091)	Radio Frequency Radiation Exposure Assessment: mobile 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 2.1091, this device belongs to mobile device category with General Population/Uncontrolled exposure.

Mobile Devices:

47 CFR 2.1091(b)

For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. In this context, the term “fixed location” means that the device is physically secured at one location and is not able to be easily moved to another location. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.

General Population/Uncontrolled Exposure:

The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity. Warning labels placed on low-power consumer devices such as cellular telephones are not considered sufficient to allow the device to be considered under the occupational/controlled category, and the general population/uncontrolled exposure limits apply to these devices.

Table 1—Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz* = Plane-wave equivalent power density

3. Maximum Average Power Summary

Frequency(MHz)	Max. Emission E(dBμV/m)	Max. Emission (W)	Time-averaging EIRP (mW)
433.92	74.58	0.0054	0.00861

Note 1: According to KDB 447498, MPE assessment is based on source-based time-averaged maximum conducted output power of the RF channel requiring assessment, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.
Note 2: The maximum emission refers to report (Report No.: SZ24030075W01).

4. RF Exposure Assessment

➢ **Standalone Transmission Assessment:**

Frequency (MHz)	Max. Emission E(dBμV/m)	Max. Emission (W)	Time-averaging EIRP (mW)	Power Density (mW/cm²)	Limit for MPE (mW/cm²)
433.92	74.58	0.0054	0.00861	<0.01	0.289
The result for 433.92MHz approach to certain low power transmitters that has low radiation, therefore the power density of 433.92MHz closes to zero.					

Note:

1. According to KDB 447498, MPE assessment is based on source-based time-averaged maximum conducted output power of the RF channel requiring assessment, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.
2. MPE calculate method

$$S = PG/4\pi R^2$$

Where: S= Power density (in appropriate units, e.g. mW/cm^2)

P = Time-average maximum tune-up power (in appropriate units, e.g. dBm)

G = numeric gain of the antenna (in appropriate units, e.g. dBi)

R = Separation distance to the centre of radiation of the antenna (20cm)

➢ **Simultaneous Transmission Assessment:**

This device only incorporates one transmitter, therefore simultaneous transmission is not required.

➢ **Conclusion:**

According to 47 CFR §2.1091, this device complies with human exposure basic restrictions.

Annex A Testing Laboratory Information

1. Identification of the Responsible Testing Laboratory

Laboratory Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Laboratory Address:	FL.1-3, 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.1-3, 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