REPORT No.：SZ19090095S01

RF EXPOSURE

EVALUATION REPORT

APPLICANT	:	Hangzhou Great Star Industrial Co., Ltd.
PRODUCT NAME	:	WIFI MODULE
MODEL NAME	:	IM-3K01
BRAND NAME	:	iMagic
FCC ID	:	2AMI2-IM-3K01
STANDARD(S)	:	47CFR 2.1091 KDB 447498
RECEIPT DATE	:	2019-09-12
TEST DATE	:	2019-10-08 to 2019-12-05
ISSUE DATE	:	2019-12-11

Edited by: Liang Yumei

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DIRECTORY

Change History		
Version	**Date**	**Reason of Changed**
1.0	2019-12-11	Original

1. Technical Information

Note: Provide by applicant.

1.1 Applicant and Manufacturer Information

Applicant:	Hangzhou Great Star Industrial Co., Ltd.
Applicant Address:	NO.35, Jiuhuan Road, Jianggan District, Hangzhou, China
Manufacturer:	Hangzhou Great Star Industrial Co., Ltd.
Manufacturer Address:	NO.35, Jiuhuan Road, Jianggan District, Hangzhou, China

1.2 Equipment under Test (EUT) Description

EUT Name:	WIFI MODULE
Hardware Version:	V1.0
Software Version:	V1.0
Frequency Bands:	WLAN 2.4GHz: 2412 MHz ~ 2472 MHz
Modulation Mode:	802.11b: DSSS 802.11g/n-HT20: OFDM
Antenna Type:	PCB antenna
Antenna Gain:	3 dBi

1.3 Applied Reference Documents

Leading reference documents for testing:

No.	Identity	Document Title	Method determination /Remark
1	47 CFR§2.1091	Radio Frequency Radiation Exposure Evaluation: mobile devices	No deviation
2	KDB 447498 D01v06	General RF Exposure Guidance	No deviation

2. Device Category and RF Exposure Limit

Per user manual, Based on 47CFR 2.1091, this device belongs to mobile device category with General Population/Uncontrolled exposure.

Mobile Devices:

47CFR 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. RF Output Power

<WLAN 2.4GHz>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-up Power	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	CH 1	2412	14.29	14.5	100.0
		CH 6	2437	14.19	14.5	
		CH 11	2462	13.55	14.5	
		CH 12	2467	**17.62**	18.0	
		CH 13	2472	17.60	18.0	
	802.11g 6Mbps	CH 1	2412	14.00	14.5	100.0
		CH 6	2437	13.54	14.0	
		CH 11	2462	13.16	14.0	
		CH 12	2467	16.74	17.0	
		CH 13	2472	16.68	17.0	
	802.11n-HT20 MCS0	CH 1	2412	14.20	14.5	100.0
		CH 6	2437	16.46	17.0	
		CH 11	2462	13.05	13.5	
		CH 12	2467	17.10	17.5	
		CH 13	2472	14.59	15.0	

Note:

According to KDB 447498 Section 4.3, MPE evaluation is 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

➢ **Standalone Transmission Evaluation:**

Bands	Frequency (MHz)	Maximum Tune-up Power (dBm)	Antenna Gain (dBi)	EIRP (mW)	Power Density (mW/cm²)	Limit for MPE (mW/cm²)
WLAN 2.4GHz	2467	18.0	3	125.89	0.025	1.0

Note:

1. According to KDB 447498, MPE evaluation is 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.
2. MPE calculate method

$$\text{Power Density} = EIRP/4\pi R^2$$

Where: EIRP = P+G

P = Output Power (dBm)

G = Antenna Gain (dBi)

R = Separation Distance (20cm)

➢ **Simultaneous Transmission Evaluation:**

This device only incorporates a WLAN 2.4G transmitter, Therefore simultaneous SAR evaluation is not required.

➢ **Conclusion:**

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

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
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

END OF REPORT