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RF Exposure Evaluation Report

Report No.: CQASZ20220300298E-04
Applicant: Jieke Trading (Shenzhen) Co., Ltd
Address of Applicant: Room 816, No.250, Laowei Area 3, Zhucun, Xikeng Community, Fucheng Street, Longhua District, Shenzhen, China
Equipment Under Test (EUT):
EUT Name: Mechanical keyboard
Model No.: LK67, LK75, LK82, LK98, TK68, TK75, TK84, TK96, TK99, CK61, CK68, CK87, K61, K66, K77, K87, K80, K98, WK75, WK80, WK98
Test Model No.: LK67
Brand Name: GAMAKEY
FCC ID: 2A48W-LK67
Standards: 47 CFR Part 1.1307
47 CFR Part 2.1093
KDB447498D01 General RF Exposure Guidance v06
Date of Receipt: 2022-3-3
Date of Test: 2022-3-3 to 2022-3-10
Date of Issue: 2022-3-16
Test Result: PASS*

*In the configuration tested, the EUT complied with the standards specified above.

Tested By: Lewis Zhou

(Lewis Zhou)

Reviewed By: Rock Huang

(Rock Huang)

Approved By: Jack Ai

(Jack Ai)



1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20220300298E-04	Rev.01	Initial report	2022-3-16

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3 General Information

3.1 Client Information

Applicant:	Jieke Trading (Shenzhen) Co., Ltd
Address of Applicant:	Room 816, No.250, Laowei Area 3, Zhucun, Xikeng Community, Fucheng Street, Longhua District, Shenzhen, China
Manufacturer:	Dongguan Hongfeng Electronic Technology Co., Ltd
Address of Manufacturer:	Guangya Industrial Park, No. 397, Hengquan Road, Hengli Town, Dongguan City, Guangdong Province
Factory:	Dongguan Hongfeng Electronic Technology Co., Ltd
Address of Factory:	Guangya Industrial Park, No. 397, Hengquan Road, Hengli Town, Dongguan City, Guangdong Province

3.2 General Description of EUT

Product Name:	Mechanical keyboard
Model No.:	LK67, LK75, LK82, LK98, TK68, TK75, TK84, TK96, TK99, CK61, CK68, CK87, K61, K66, K77, K87, K80, K98, WK75, WK80, WK98
Test Model No.:	LK67
Trade Mark:	GAMAKAY
Software Version:	V305
Hardware Version:	RGBV3.0
Power Supply:	Li-ion battery: DC 3.7V 2400mAh, Charge by DC 5V

3.3 General Description of BLE

Operation Frequency:	2402MHz~2480MHz
Modulation Type:	GFSK
Transfer Rate:	1Mbps
Number of Channel:	40
Product Type:	☒ Mobile ☐ Portable ☐ Fix Location
Antenna Type:	PCB antenna
Antenna Gain:	2.14dBi

3.4 General Description of BT

Operation Frequency:	2402MHz~2480MHz
Modulation Type:	GFSK
Transfer Rate:	1Mbps
Number of Channel:	79
Product Type:	☐ Mobile ☒ Portable ☐ Fix Location
Antenna Type:	PCB antenna
Antenna Gain:	2.14dBi

Note:

Model No.: LK67, LK75, LK82, LK98, TK68, TK75, TK84, TK96, TK99, CK61, CK68, CK87, K61, K66, K77, K87, K80, K98, WK75, WK80, WK98

Only the model LK67 was tested, since the electrical circuit design, layout, components used and internal wiring were identical for the above models, with difference being color of appearance and model name.

4 SAR Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 Standard Requirement

According to KDB447498D01 General RF Exposure Guidance v06

4.3.1. Standalone SAR test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

4.1.2 Limits

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$$\left[\frac{(\text{max. power of channel, including tune-up tolerance, mW})}{(\text{min. test separation distance, mm})} \right] \cdot \sqrt{f(\text{GHz})} \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where}$$

$f(\text{GHz})$ is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation¹⁷

The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

4.1.3 EUT RF Exposure

1) For BLE

Measurement Data

GFSK mode (1Mbps)				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	1.35	1.5±1	2.5	1.778
Middle(2440MHz)	2.61	2.5±1	3.5	2.239
Highest(2480MHz)	2.7	2.5±1	3.5	2.239

Worst case: GFSK mode (1Mbps)						
Channel	Maximum Peak Conducted Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune- up Power		Calculated value	Exclusion threshold
			(dBm)	(mW)		
Lowest (2402MHz)	1.35	1.5±1	2.5	1.778	0.551	3.0
Middle (2440MHz)	2.61	2.5±1	3.5	2.239	0.700	
Highest (2480MHz)	2.7	2.5±1	3.5	2.239	0.705	
Conclusion: the calculated value ≤3.0, SAR is exempted.						

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20220300298E-02
BT can not simultaneous transmitting at same time.

2) For BT

Measurement Data

GFSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	1.38	1±1	2	1.585
Middle(2441MHz)	2.54	2.5±1	3.5	2.239
Highest(2480MHz)	2.14	2.5±1	3.5	2.239

Worst case: GFSK mode						
Channel	Maximum Peak Conducted Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune- up Power		Calculated value	Exclusion threshold
			(dBm)	(mW)		
Lowest (2402MHz)	1.38	1±1	2	1.585	0.491	3.0
Middle (2441MHz)	2.54	2.5±1	3.5	2.239	0.700	
Highest (2480MHz)	2.14	2.5±1	3.5	2.239	0.705	
Conclusion: the calculated value ≤3.0, SAR is exempted.						

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20220300298E-01
BLE can not simultaneous transmitting at same time.

*** END OF REPORT ***