RF TEST REPORT

Product Name: LORA multi-function positioning terminal

Model Name: KG-04-NA

FCC ID: 2AQSK-KG-04-NA

Issued For	:	HuiZhou BoShiJie Technology CO.,Ltd No. 1, Huifeng West three road, Zhongkai Hi-tech Zone, Huizhou
Issued By	:	Shenzhen LGT Test Service Co., Ltd. Room 205, Building 13, Zone B, Zhenxiong Industrial Park, No.177, Renmin West Road, Jinsha, Kengzi Street, Pingshan District, Shenzhen, Guangdong, China

Report Number:	LGT24K191HA01
Sample Received Date:	Nov. 27, 2024
Date of Test:	Nov. 27, 2024 ~ Dec. 11, 2024
Date of Issue:	Dec. 11, 2024

TEST REPORT CERTIFICATION

Applicant:	HuiZhou BoShiJie Technology CO.,Ltd
Address:	No. 1, Huifeng West three road, Zhongkai Hi-tech Zone, Huizhou
Manufacturer:	HuiZhou BoShiJie Technology CO.,Ltd
Address:	No. 1, Huifeng West three road, Zhongkai Hi-tech Zone, Huizhou
Product Name:	LORA multi-function positioning terminal
Trademark:	N/A
Model Name:	KG-04-NA
Sample Status:	Normal

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC 47 CFR §2.1091 KDB 447498 D01 General RF Exposure Guidance v06	PASS

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TABLE OF CONTENTS

Revision History

Rev.	Issue Date	Revisions
00	Dec. 11, 2024	Initial Issue

1. GENERAL INFORMATION

1.1 GENERAL DESCRIPTION OF THE EUT

Product Name:	LORA multi-function positioning terminal	
Trademark:	N/A	
Model Name:	KG-04-NA	
Series Model:	N/A	
Model Difference:	N/A	
Frequency Bands:	GSM	GSM 900: 880 ~ 915 MHz GSM 1800:1710 ~ 1785 MHz
	LTE	FDD LTE Band 2:1850~1910MHz FDD LTE Band 4:1710~1755MHz FDD LTE Band 5: 824~849MHz FDD LTE Band 12: 699-716MHz FDD LTE Band 13: 777-787MHz FDD LTE Band 17:704~716MHz
	ISM	922MHz
Rating:	Input: DC 9-90V	
Battery:	Capacity: 400mAh Rated Voltage:3.7V	
Hardware Version:	N/A	
Software Version:	N/A	

1.2 TEST LABORATORY

Company Name:	Shenzhen LGT Test Service Co., Ltd.
Address:	Room 205, Building 13, Zone B, Zhenxiong Industrial Park, No.177, Renmin West Road, Jinsha, Kengzi Street, Pingshan District, Shenzhen, Guangdong, China
Accreditation Certificate	A2LA Certificate No.: 6727.01
	FCC Registration No.: 746540
	CAB ID: CN0136

2. FCC 47CFR §2.1091 REQUIREMENT

2.1 TEST STANDARDS

The limit for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 is followed. The gain of the antennas used in the product is extracted from the Antenna data sheets provided and also the maximum total power input to the antenna is measured. Through the Friis transmission formula and the maximum gain of the antenna, we can calculate the distance, away from the product, where the limit of MPE is reached.
Although the Friis Transmission formula is far field assumption, the calculated result of that is an over-prediction for near field power density. It is taken as worst case to specify the safety range.

2.2 LIMIT

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environmental impact of the human exposure to radio-frequency (RF) radiation as specified in 1.1307 (b)

Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)
Limits for Occupational / controlled Exposures			
0.3-3.0	614	1.63	*(100)
3.0-30	1842/f	4.89/f	*($900/f^2$)
30-300	61.4	0.163	1.0
300 - 1500	--	--	F/300
1500 – 100000	--	--	5.0
Limits for General population / Uncontrolled Exposure			
0.3-1.34	614	1.63	*(100)
1.34-30	824/f	2.19/f	*($180/f^2$)
30-300	27.5	0.073	0.2
300 - 1500	--	--	F/1500
1500 – 100000	--	--	1.0

F= Frequency in MHz

* = Plane-wave equivalent power density.

Friss Formula

Friss Transmission Formula: $Pd = (Pout * G) / (4*pi*r^2)$

Where

Pd = power density in mW/cm^2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = Distance between observation point and the center of radiator in cm

If we know the maximum gain of the antenna and the total output power to the antenna, through calculation, we will know MPE value at distance 20cm.

2.3 EUT OPERATION CONDITION

EUT was enabled to transmit and receive at lowest, middle and highest channels.

2.4 CLASSIFICATION

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. Warning statement to the user for keeping at least 20cm or more separation distance from the antenna should be included in the User manual. So, this device is classified as Mobile device.

2.5 TEST RESULT

Turn up Result

Mode	Turn up Power
GSM 850	31±1dBm
GSM 1900	29±1dBm
LTE B2	23.5±1dBm
LTE B4	22.5±1dBm
LTE B5	22.5±1dBm
LTE B12	22.5±1dBm
LTE B13	22.5±1dBm
LTE B17	22±1dBm
LORA-FSK	3.5±1dBm

The MPE result of worst mode:

RF Function	Frequency (MHz)	Max Turn up Power (dBm)	Duty cycle factor	Max Power (dBm)	Max Power (mW)	ANT Gain (dBi)	ANT Gain (gain of antenna in linear scale)	Power Density (mW/cm²)	Limit (mW/cm²)	Ratio	Result
GSM (2Slot)	836.6	32	-6.02	25.98	396.28	1.67	1.47	0.116	0.558	0.208	Pass
LTE	1902.5	24.5	0	24.5	281.84	1.15	1.30	0.073	1	0.073	Pass

RF Function	Frequency (MHz)	Max Turn up Power (dBm)	Max Turn up Power (mW)	ANT Gain (dBi)	ANT Gain (gain of antenna in linear scale)	Power Density (mW/cm²)	Limit (mW/cm²)	Ratio	Result
ISM	922	4.50	2.82	2.09	1.62	0.0009	0.615	0.001	Pass

The max MPE of simultaneous transmission:

GSM(0.208)+ ISM (0.001)=0.209＜1

Note:

1. The Maximum Power Density is less than the limit, complies with the exemption requirements.

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