

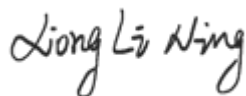
TEST REPORT

Applicant: XOGO Inc
Address: 12723 E Palouse Hwy. Valleyford, WA 99036
Equipment Type: XOGO Mini Max
Model Name: XOGO 4K (refer to section 2.3)
Brand Name: XOGO
FCC ID: 2BGG5-XOGO4K
Test Standard: 47 CFR Part 2.1091
KDB 447498 D04 v01
Sample Arrival Date: May 11, 2024
Test Date: May 17, 2024 - May 28, 2024
Date of Issue: Jul. 09, 2024

ISSUED BY:

Shenzhen BALUN Technology Co., Ltd.

Tested by: Xiong Lining



Checked by: Xu Rui



Approved by: Tolan Tu
(Testing Director)



Revision History		
Version	Issue Date	Revisions Content
<u>Rev. 01</u>	<u>Jul. 09, 2024</u>	<u>Initial Issue</u>

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1 GENERAL INFORMATION

1.1 Test Laboratory

Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100

1.2 Test Location

Name	Shenzhen BALUN Technology Co., Ltd.
Location	<input checked="" type="checkbox"/> Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
	<input type="checkbox"/> 1/F, Building B, Ganghongji High-tech Intelligent Industrial Park, No. 1008, Songbai Road, Yangguang Community, Xili Sub-district, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	XOGO Inc
Address	12723 E Palouse Hwy. Valleyford, WA 99036

2.2 Manufacturer Information

Manufacturer	Shenzhen SEI Robotics Co, Ltd.
Address	401, Productivity Building D, #5 Hi-Tech Middle 2nd Road, Shenzhen Hi-Tech Industrial Park, Nanshan District, Shenzhen, China

2.3 General Description for Equipment under Test (EUT)

EUT Name	XOGO Mini Max
Model Name Under Test	XOGO 4K
Series Model Name	SN6BKSA; SN6BKSX (X: A-Z)
Description of Model name differentiation	The circuit, PCB layout, electrical components and appearance of the above model are exactly the same as the basic model, except the model names are different due to different market and customer needs. (this information provided by the applicant)
Hardware Version	N/A
Software Version	N/A
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.4 Technical Information

Network and Wireless connectivity	Bluetooth (BR+EDR+BLE) 2.4G WIFI 802.11b, 802.11g and 802.11n(HT20/40) 5G WIFI 802.11a, 802.11n(HT20/40) and 802.11ac(VHT20/40/80) U-NII-1/3
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The requirement for the following technical information of the EUT was tested in this report:

Operating Mode	Bluetooth ;2.4G WLAN; 5G WLAN	
Frequency Range	Bluetooth	2402 ~ 2480 MHz
	802.11b/g/n(HT20/HT40)	2412 ~ 2462 MHz
	802.11a/ n(HT20/HT40)	5150 ~ 5250 MHz
		5725 ~ 5850 MHz
802.11ac (VHT20/VHT40/VHT80)	5150 ~ 5250 MHz	
	5725 ~ 5850 MHz	
Antenna Type	Bluetooth	PCB Antenna
	WLAN	PCB Antenna
Exposure Category	General Population/Uncontrolled Exposure	
Product Type	Mobile Device	

3 SUMMARY OF TEST RESULT

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 2.1091	Radiofrequency radiation exposure evaluation: mobile devices
2	KDB 447498 D04 v01	447498 D04 Interim General RF Exposure Guidance v01

4 DEVICE CATEGORY AND LEVELS LIMITS

Mobile Devices:

CFR Title 47 §2.1091(b)

(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.

FCC KDB 447498 D04 General RF Exposure Guidance v01 Limit

Evaluation of compliance with the exposure limits in § 1.1310 is necessary if the ERP of the device is greater than ERP_{20cm} in Formula (B.1) [repeated from § 2.1091(c)(1) and § 1.1307(b)(1)(i)(B)].

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases} \quad (\text{B.1})$$

If the ERP is not easily obtained, then the available maximum time-averaged power may be used (i. e., without consideration of ERP only if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole.

SAR-based exemptions are constant at separation distances between 20 cm and 40 cm to avoid discontinuities in the threshold when transitioning between SAR-based and MPE-based exemption criteria at 40 cm, considering the importance of reflections.

The SAR-based exemption formula of § 1.1307(b)(3)(i)(B), repeated here as Formula (B.2), applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold P_{th} (mW).

This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by Formula (B.2).

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases} \quad \text{(B. 2)}$$

where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right)$$

and f is in GHz, d is the separation distance (cm), and $ERP_{20\text{cm}}$ is per Formula (B.1). The example values shown in Table B.2 are for illustration only.

Table B.2—Example Power Thresholds (mW)

Frequency (MHz)	Distance (mm)									
	5	10	15	20	25	30	35	40	45	50
300	39	65	88	110	129	148	166	184	201	217
450	22	44	67	89	112	135	158	180	203	226
835	9	25	44	66	90	116	145	175	207	240
1900	3	12	26	44	66	92	122	157	195	236
2450	3	10	22	38	59	83	111	143	179	219
3600	2	8	18	32	49	71	96	125	158	195
5800	1	6	14	25	40	58	80	106	136	169

5 ASSESSMENT RESULT

5.1 Output Power

Mode	Bluetooth
Conducted Power (dBm)	8.16
Antenna Gain (dBi)	1.59
EIRP (dBm)	9.75

Note: This report listed the maximal case power value, please refer to BL-SZ2450413-601& BL-SZ2450413-602 report for more details.

Mode	2.4G WIFI	
	SISO-Antenna A	SISO-Antenna B
Conducted Power (dBm)	18.06	16.95
Antenna Gain (dBi)	2.39	1.59
EIRP (dBm)	20.45	18.54

Note: This report listed the maximal case power value, please refer to BL-SZ2450413-603 report for more details.

Mode	5.2G WIFI		5.8G WIFI	
	SISO-Antenna A	SISO-Antenna B	SISO-Antenna A	SISO-Antenna B
Conducted Power (dBm)	16.64	15.85	16.93	15.68
Antenna Gain (dBi)	-1.46	-1.45	-0.63	-1.88
EIRP (dBm)	15.18	14.40	16.30	13.80

Note: This report listed the maximal case power value, please refer to BL-SZ2450413-604 report for more details.

5.2 Tune-up power

Mode	Conducted Power Range (dBm)	EIRP Range (dBm)	ERP Range (dBm)
Bluetooth	[7.00, 9.00]	[8.00, 10.00]	[5.85, 7.85]
2.4G WIFI SISO-Antenna A	[17.00, 19.00]	[19.00, 21.00]	[16.85, 18.85]
2.4G WIFI SISO-Antenna B	[15.00, 17.00]	[17.00, 19.00]	[14.85, 16.85]
5.2G WIFI SISO-Antenna A	[15.00, 17.00]	[14.00, 16.00]	[11.85, 13.85]
5.2G WIFI SISO-Antenna B	[14.00, 16.00]	[13.00, 15.00]	[10.85, 12.85]
5.8G WIFI SISO-Antenna A	[15.00, 17.00]	[15.00, 17.00]	[12.85, 14.85]
5.8G WIFI SISO-Antenna B	[14.00, 16.00]	[12.00, 14.00]	[9.85, 11.85]

Note1: ERP= EIRP -2.15dB.
Note2: According KDB 447498 D04, used the greater of maximum conducted power and ERP to compare with the threshold value Pth.

5.3 RF Exposure Evaluation Result

Evolution mode	Maximum power (dBm)	Maximum power (mw)	Distance (mm)	Threshold Power (mW)	Power / Limit	Verdict
Bluetooth	9.00	7.94	200	3060.00	0.003	Pass
2.4G WIFI SISO-Antenna A	19.00	79.43	200	3060.00	0.026	Pass
2.4G WIFI SISO-Antenna B	17.00	50.12	200	3060.00	0.016	Pass
5.2G WIFI SISO-Antenna A	17.00	50.12	200	3060.00	0.016	Pass
5.2G WIFI SISO-Antenna B	16.00	39.81	200	3060.00	0.013	Pass
5.8G WIFI SISO-Antenna A	17.00	50.12	200	3060.00	0.016	Pass
5.8G WIFI SISO-Antenna B	16.00	39.81	200	3060.00	0.013	Pass

5.4 Collocated Power Calculation

Evolution mode	Frequency (MHz)	Power /Limit	Σ (Power / Limit) of Bluetooth + 2.4G WIFI SISO-Antenna A + 2.4G WIFI SISO-Antenna B	Verdict
Bluetooth	2480	0.003	0.045	Pass
2.4G WIFI SISO-Antenna A	2462	0.026		
2.4G WIFI SISO-Antenna B	2462	0.016		
Evolution mode	Frequency (MHz)	Power /Limit	Σ (Power / Limit) of Bluetooth + Max. 5G WIFI SISO-Antenna A + Max. 5G WIFI SISO-Antenna B	Verdict
Bluetooth	2480	0.003	0.032	Pass
Max. 5G WIFI SISO-Antenna A	5850	0.016		
Max. 5G WIFI SISO-Antenna B	5850	0.013		

Note:

- Σ (Power / Limit): This is a summation of [(power for each transmitter/ antenna included in the simultaneous transmission)/ (corresponding Power limit)], for Bluetooth + 2.4G WIFI SISO-Antenna A + 2.4G WIFI SISO-Antenna B & Bluetooth + Max. 5G WIFI SISO-Antenna A + Max. 5G WIFI SISO-Antenna B.
- Both of the Bluetooth/2.4G WIFI or Bluetooth/5G WIFI can transmit simultaneously, the formula of calculated the Power is
 $CP1 / LP1 + CP2 / LP2 + \dots \text{etc.} < 1$
 CP = Calculation power
 LP = Limit of power
- The worst-case situation is 0.045, which is less than "1". This confirmed that the device comply with FCC KDB 447498 D04 Power limit.
- The DUT work frequency range used is 2402 MHz ~ 2480 MHz, 2412 MHz ~ 2462 MHz, 5150 MHz ~ 5250 MHz and 5725 MHz ~ 5850 MHz the result close to the limit by the above formula, so we select worst case power to calculate the exclusion power threshold.
- More power list please refer to RF test report.

5.5 Conclusion

This EUT is deemed to comply with the reference level limits, therefore the basic restrictions are compliant with human exposure limits.

Statement

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--END OF REPORT--