

1 Cover Page

RF Exposure Evaluation Report

Application No.: SHEM2106005812CR
FCC ID: 2A2CXFBXB001
Applicant: Suijimanbu (SHANGHAI) Sports Technology Co. Ltd.
Address of Applicant: 1201 Building B, Greenbelt Convergence Center, 500 Yunjin Road, Xuhui District, Shanghai, China
Manufacturer: Suijimanbu (SHANGHAI) Sports Technology Co. Ltd.
Address of Manufacturer: 1201 Building B, Greenbelt Convergence Center, 500 Yunjin Road, Xuhui District, Shanghai, China
Factory: WNQ (Shanghai) Body-building Equipment Co.,Ltd
Address of Factory: No. 388,Beiyong Road,(No. 1588,Beiyong Road,Qingpu Area,Shanghai. China
Equipment Under Test (EUT):
EUT Name: freebeat
Model No.: xbike
Trade mark: freebeat
Standard(s) : FCC Rules 47 CFR §2.1091
 KDB447498 D01 General RF Exposure Guidance v06
Date of Receipt: 2021-06-09
Date of Test: 2021-06-21 to 2021-07-27
Date of Issue: 2021-07-27

Test Result:	Pass*
---------------------	--------------

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

Parlan Zhan

Parlan Zhan
Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.
Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com



Revision Record			
Version	Description	Date	Remark
00	Original	2021-07-27	/

Authorized for issue by:				
		Vincent Zhu /Project Engineer		
				
		Parlam Zhan /Reviewer		



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com



2 Contents

	Page
1 COVER PAGE	1
2 CONTENTS	3
3 GENERAL INFORMATION	4
3.1 GENERAL DESCRIPTION OF E.U.T.	4
3.2 TECHNICAL SPECIFICATIONS	4
3.3 TEST LOCATION	6
3.4 TEST FACILITY.....	6
4 TEST STANDARDS AND LIMITS	7
4.1 FCC RADIOFREQUENCY RADIATION EXPOSURE LIMITS:.....	7
5 MEASUREMENT AND CALCULATION	7
5.1 MAXIMUM TRANSMIT POWER	7
5.2 MPE CALCULATION	10
5.3 CONCLUSION.....	11



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Document.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

3 General Information

3.1 General Description of E.U.T.

Power supply:	12VDC 3A by adapter Adapter: Model: XSG-1203000HUS Input: 100-240VAC 50/60Hz 0.8A Max Output: 12VDC 3A
---------------	--

3.2 Technical Specifications

BT

Antenna Gain:	1.97dBi (Provided by manufacturer)
Antenna Type:	PIFA Antenna
Bluetooth Version:	V5.0 Dual mode
Channel Spacing:	1MHz
Modulation Type:	GFSK, $\pi/4$ DQPSK, 8DPSK
Number of Channels:	79
Operation Frequency:	2402MHz to 2480MHz
Spectrum Spread Technology:	Frequency Hopping Spread Spectrum(FHSS)

BLE

Antenna Gain:	1.97dBi (Provided by manufacturer)
Antenna Type:	PIFA Antenna
Bluetooth Version:	V5.0 Dual mode
Channel Spacing:	2MHz
Modulation Type:	GFSK
Number of Channels:	40
Operation Frequency:	2402MHz to 2480MHz

2.4GHz WiFi

Antenna Gain:	1.97dBi (Provided by manufacturer)
Antenna Type:	PIFA Antenna
Channel Spacing:	5MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channels:	802.11b/g/n(HT20):11
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.
Attention: To check the authenticity of testing/inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

5GHz WiFi

Operation Frequency:	Band	Mode	Frequency Range(MHz)	Number of channels
	UNII Band I	802.11a/n(HT20)/ac(HT20)	5180-5240	4
		802.11n(HT40)/ac(HT40)	5190-5230	2
		802.11ac(HT80)	5210	1
	UNII Band II-A	802.11a/n(HT20)/ac(HT20)	5260-5320	4
		802.11n(HT40)/ac(HT40)	5270-5310	2
		802.11ac(HT80)	5290	1
	UNII Band II-C	802.11a/n(HT20)/ac(HT20)	5500-5700	11
		802.11n(HT40)/ac(HT40)	5510-5670	5
		802.11ac(HT80)	5530~5610	2
UNII Band III	802.11a/n(HT20)/ac(HT20)	5745-5825	5	
	802.11n(HT40)/ac(HT40)	5755-5795	2	
	802.11ac(HT80)	5775	1	
Modulation Type:	802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)			
Date Rate:	802.11a:6/9/12/18/24/36/48/54Mbps 802.11n: MCS0-MCS7 802.11ac: VHT MCS0-MCS7			
Channel Spacing:	802.11a/n(HT20)/ac(HT20): 20MHz 802.11n(HT40)/ac(HT40): 40MHz 802.11ac(HT80): 80MHz			
Antenna Gain:	2.52dBi (Provided by manufacturer)			
Antenna Type:	PIFA Antenna			
TPC Function:	Not support			
DFS Function:	Slaver without radar detection			



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.
Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

3.3 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. E&E Lab
588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China
Tel: +86 21 6191 5666 Fax: +86 21 6191 5678

No tests were sub-contracted.

3.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **A2LA (Certificate No. 6332.01)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the American Association for Laboratory Accreditation(A2LA).

- **FCC (Designation Number: CN1301)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

- **ISED (CAB Identifier: CN0020)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. EMC Laboratory has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory. Company Number: 8617A

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.
Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

4 Test Standards and Limits

4.1 FCC Radiofrequency radiation exposure limits:

According to §1.1310, the limit for general population/uncontrolled exposures

Frequency	Power density(mW/cm ²)	Averaging time(minutes)
300MHz~1.5GHz	f/1500	30
1.5GHz~100GHz	1.0	30

5 Measurement and Calculation

5.1 Maximum transmit power

The Power Data is based on the RF Test Report SHEM210600581201, SHEM210600581202, SHEM210600581203, SHEM210600581204.

BT

Test Mode	Test Frequency (MHz)	Output Power (dBm)	Reading Power (mW)
DH5	2402	2.06	1.61
	2441	5.25	3.35
	2480	6.08	4.06
2DH5	2402	0.07	1.02
	2441	2.42	1.75
	2480	2.95	1.97
3DH5	2402	0.28	1.07
	2441	2.71	1.87
	2480	3.79	2.39

BLE

Test Mode	Test Frequency (MHz)	Output Power (dBm)		Reading Power (mW)	
		1M	2M	1M	2M
BLE	2402	-2.21	-2.19	0.60	0.60
	2440	0.38	0.39	1.09	1.09
	2480	1.04	1.05	1.27	1.27



2.4GHz

Test Mode	Test Frequency (MHz)	Output Power (dBm)	Reading Power (mW)
11B	2412	16.48	44.46
11B	2437	17.39	54.83
11B	2462	18.11	64.71
11G	2412	21.75	149.62
11G	2437	23.11	204.64
11G	2462	23.48	222.84
11N20SISO	2412	22.27	168.66
11N20SISO	2437	23.32	214.78
11N20SISO	2462	24.02	252.35

5GHz

Test Mode	Test Frequency (MHz)	Output Power (dBm)	Reading Power (mW)
11A	5180	12.39	17.34
11A	5220	13.19	20.84
11A	5240	13.53	22.54
11A	5260	16.49	44.57
11A	5280	16.29	42.56
11A	5320	17.11	51.40
11A	5500	16.14	41.11
11A	5600	14.78	30.06
11A	5700	12.26	16.83
11A	5745	13.22	20.99
11A	5785	12.34	17.14
11A	5825	12.29	16.94
11N20	5180	12.04	16.00
11N20	5220	12.88	19.41
11N20	5240	13.25	21.13
11N20	5260	16.13	41.02
11N20	5280	16.24	42.07
11N20	5320	16.95	49.55
11N20	5500	15.80	38.02
11N20	5600	14.52	28.31



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing/inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

11N20	5700	12.01	15.89
11N20	5745	12.44	17.54
11N20	5785	11.70	14.79
11N20	5825	11.97	15.74
11N40	5190	12.14	16.37
11N40	5230	13.41	21.93
11N40	5270	17.37	54.58
11N40	5310	17.80	60.26
11N40	5510	16.51	44.77
11N40	5590	15.13	32.58
11N40	5670	13.23	21.04
11N40	5755	12.48	17.70
11N40	5795	12.52	17.86
11AC20	5180	15.24	33.42
11AC20	5220	15.73	37.41
11AC20	5240	16.16	41.30
11AC20	5260	16.04	40.18
11AC20	5280	16.23	41.98
11AC20	5320	16.87	48.64
11AC20	5500	15.76	37.67
11AC20	5600	14.38	27.42
11AC20	5700	11.89	15.45
11AC20	5745	12.04	16.00
11AC20	5785	11.57	14.35
11AC20	5825	12.00	15.85
11AC40	5190	15.56	35.97
11AC40	5230	16.29	42.56
11AC40	5270	17.34	54.20
11AC40	5310	18.03	63.53
11AC40	5510	16.47	44.36
11AC40	5590	15.01	31.70
11AC40	5670	13.00	19.95
11AC40	5755	12.32	17.06
11AC40	5795	12.35	17.18
11AC80	5210	15.89	38.82



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing/inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

11AC80	5290	16.82	48.08
11AC80	5530	15.86	38.55
11AC80	5610	13.72	23.55
11AC80	5775	11.39	13.77

5.2 MPE Calculation

For FCC:

According to the formula $S=P/4\pi R^2$, we can calculate S which is MPE.

Note:

- 1) P (mW)
- 2) R = distance to the center of radiation of antenna (in meter) = 20cm
- 3) MPE limit = 1mW/cm²

BT&BLE

The max. antenna gain is 1.97 dBi

Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Result
4.06	1.574	20	0.00127	1	Pass

For 2.4G WiFi:

The max. antenna gain is 1.97 dBi

Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Result
252.35	1.574	20	0.07902	1	Pass

For 5G WiFi:

The max. antenna gain is 2.52 dBi

Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Result
63.53	1.786	20	0.02258	1	Pass

The BT and the WiFi can simultaneous transmitting at frequency 2.4GHz band, so the maximum rate of MPE is $0.001/1.0+0.079/1.0=0.080\leq 1.0$. according to the KDB447498 section 7.2 determine the device is exclusion from SAR test.



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.
Attention: To check the authenticity of testing/inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com



5.3 Conclusion

EUT complies with FCC Rules 47 CFR §2.1091 requirement.

--End of the Report--



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.
Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com