

1 Cover Page

RF Exposure Evaluation Report

Application No.: SHCR2207001448HS
FCC ID: 2A8JPSTEAMBOX01
IC: 29049-STEAMBOX01
Applicant: Steambox B.V.
Address of Applicant: Laan van Ypenburg 108 Den Haag 2497GC Netherlands
Manufacturer: Steambox B.V.
Address of Manufacturer: Laan van Ypenburg 108 Den Haag 2497GC Netherlands
Factory: Hengzhi Electronic Technology (Shanghai) Co., Ltd
Address of Factory: Floor 3, building 2, No.99, Lanyu Road, Jiading District, Shanghai
Equipment Under Test (EUT):
EUT Name: Electric Lunchbox
Model No.: STEAMBOX-01
Trade Mark: Steambox
Standard(s) : FCC Rules 47 CFR §2.1093
 KDB447498 D01 General RF Exposure Guidance v06
 RSS-102 Issue 5 Amendment 1 (February 2, 2021)
Date of Receipt: 2022-07-18
Date of Test: 2022-07-29 to 2022-08-05
Date of Issue: 2022-08-15

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Parlam Zhan

Parlam Zhan
Laboratory Manager



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Revision Record			
Version	Description	Date	Remark
00	Original	2022-08-15	/

Authorized for issue by:			
		Bill Wu	
		Bill Wu/Project Engineer	
		Parlam Zhan	
		Parlam Zhan /Reviewer	



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3 General Information

3.1 General Description of E.U.T.

Power supply:	DC 12.8V 6000mAh Rechargeable battery Charging adapter: Model:A361-1442300I Input:100-240V~50/60Hz Output:14.4V  2.3A 33.1W
Product Type:	<input checked="" type="checkbox"/> Portable device <input type="checkbox"/> Mobile device <input type="checkbox"/> Fixed device

3.2 Details of E.U.T.

Operation Frequency:	2402MHz to 2480MHz
Modulation Type:	GFSK
Data Rate:	1Mbps,2Mbps
Number of Channels:	40
Channel Spacing:	2MHz
Antenna Type:	PCB Antenna
Antenna Gain:	1.5dBi (Provided by manufacturer)
S/N:	8719327598740
Firmware Version:	hz-st-rv8.6

3.3 Separation Distance

Separation distance between the antenna to person (R):	<5mm
Remark: This minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander.	



3.4 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.

Note:

1. SGS is not responsible for wrong test results due to incorrect information (e.g. max. clock frequency, highest internal frequency, antenna gain, cable loss, etc) is provided by the applicant. (if applicable).
2. SGS is not responsible for the authenticity, integrity and the validity of the conclusion based on results of the data provided by applicant. (if applicable).

3.5 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.



4 FCC Radiofrequency radiation exposure limits

4.1 FCC Radiofrequency radiation exposure 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:

$[(\text{max power of channel})/(\text{min test separation distance})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR and ≤ 7.5 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
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds

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 according to 4.1 f) is applied to determine SAR test exclusion. For 2.4G band device, the limit of worse case is

$$P_{\text{max}} \leq 7.5 \cdot D_{\text{min}} / \sqrt{f} = 7.5 \cdot 5 / \sqrt{2.480} = 23.81 \text{ mW}$$



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5 IC Radiofrequency radiation exposure limits

According to RSS-102 section 2.5.1, SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance

MHz	5	10	15	20	25	30	35	40	45	50	mm
≤300	71	101	132	162	193	223	254	284	315	345	mW
450	52	70	88	106	123	141	159	177	195	213	
835	17	30	42	55	67	80	92	105	117	130	
1900	7	10	18	34	60	99	153	225	316	431	
2450	4	7	15	30	52	83	123	173	235	309	
3500	2	6	16	32	55	86	124	170	225	290	
5800	1	6	15	27	41	56	71	85	97	106	

Output power level shall be the higher of the maximum conducted or equivalent isotropically radiated power (e.i.r.p.) source-based, time-averaged output power. For controlled use devices where the 8 W/kg for 1 gram of tissue applies, the exemption limits for routine evaluation are multiplied by a factor of 5. For limb-worn devices where the 10 gram value applies, the exemption limits for routine evaluation in Table 1 are multiplied by a factor of 2.5. If the operating frequency of the device is between two frequencies located in Table 1, linear interpolation shall be applied for the applicable separation distance. For test separation distance less than 5 mm, the exemption limits for a separation distance of 5 mm can be applied to determine if a routine evaluation is required.

The practical use condition for this device is as a handheld accessories. So the applicable limit is 10-g extremity SAR

For 2.4G band device, the limit is $P_{\max} \leq 2.5 \times 4 = 10 \text{ mW}$



6 Measurement and Calculation

6.1 Maximum transmit power

The Power Data is based on the RF Test Report SHCR220700144801.

TestMode	Antenna	Channel	Power[dBm]	Power[mW]
BLE_1M	Ant1	2402	-0.34	0.925
		2440	-0.42	0.908
		2480	-1.86	0.652
BLE_2M	Ant1	2402	-0.39	0.914
		2440	-0.37	0.918
		2480	-2.02	0.628

6.2 RF Exposure Calculation

The Max Conducted Peak Output Power is 0.925 mW. The best case gain of the antenna is 1.5dBi.

2dBi logarithmic terms convert to numeric result is nearly 1.41.

According to the formula. calculate the EIRP test result:

$$\text{EIRP} = P \times G = 0.925 \text{ mW} \times 1.41 = 1.46 \text{ mW} < 10 \text{ mW} < 23.81 \text{ mW}$$

So, the device is to qualify for SAR test exemption, the exemption report is in lieu of the SAR report.

--End of the Report--

