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Report No.: 2302RSU036-U2 Report Version: V01 Issue Date: 2023-03-30

RF Exposure Evaluation Declaration

FCC ID: 2BADC-SUBWOOFER

Applicant: Soundvision Technologies DBA TruAudio and VSSL

Product: SX Subwoofer

Model No.: SXSUB

Brand Name: VSSL

FCC Classification: Digital Transmission System (DTS)

FCC Rule Part(s): FCC Part 2.1091

Result: Complies

Reviewed By:

Kevin Guo

Robin Wu

Kevin Guo

ACCREDITED

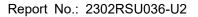
TESTING LABORATORY
CERTIFICATE #3628.01

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

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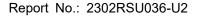
Revision History

Report No.	Version	Description	Issue Date	Note
2302RSU036-U2	V01	Initial Report	2023-03-30	Valid



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1. General Information

1.1. Applicant

Soundvision Technologies DBA TruAudio and VSSL 192 Old Highway 91, Hurricane, Utah 84737, USA

1.2. Manufacturer

Soundvision Technologies DBA TruAudio and VSSL 192 Old Highway 91, Hurricane, Utah 84737, USA

1.3. Testing Facility

	Test Site - MRT	Test Site – MRT Suzhou Laboratory					
	Laboratory Loca	Laboratory Location (Suzhou - Wuzhong)					
D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, Chin							
	Laboratory Loca	ntion (Suzhou - SIP	')				
	4b Building, Liand	do U Valley, No.200	Xingpu Rd., Shengpu	u Town, Suzhou Indu	ıstrial Park, China		
	Laboratory Accre	editations					
	A2LA: 3628.01		CNAS	S: L10551			
	FCC: CN1166		ISED:	: CN0001			
	VOCI.	□R-20025	□G-20034	□C-20020	□T-20020		
	VCCI:	□R-20141	□G-20134	□C-20103	□T-20104		
	☐ Test Site – MRT Shenzhen Laboratory						
	Laboratory Loca	tion (Shenzhen)					
	1G, Building A, Ju	ınxiangda Building,	Zhongshanyuan Roa	ıd West, Nanshan Di	strict, Shenzhen, China		
	Laboratory Accre	editations					
	A2LA: 3628.02		CNAS	s: L10551			
	FCC: CN1284		ISED:	CN0105			
	Test Site – MRT Taiwan Laboratory						
	Laboratory Location (Taiwan) No. 38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)						
	Laboratory Accreditations						
	TAF: L3261-1907	25					
	FCC: 291082, TW	V 3261	ISED:	TW3261			



1.4. Product Information

Product Name	SX Subwoofer
Model No.	SXSUB
Bluetooth Specification	V5.1 Bluetooth-LE only
Wireless Specification	5180-5240MHz & 5736-5814MHz
Operating Temp.	0 ~ 40°C
Product Voltage	100-120VAC/ 220-240VAC, 50/60Hz, 350W

Note: The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.

1.5. Device Classification

According to the user manual, the antenna of this device is at least 20cm away from the body of the user, this device is classified as a Mobile Device. So, the RF exposure evaluation requirements of § 2.1091 for mobile device exposure conditions subject to MPE limits.

1.6. Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

FCC Part 2.1091 & KDB 447498 D04 Interim General RF Exposure Guidance v01

1.7. Antenna Details

Antenna Type	Frequency Band	Max Antenna Gain		
	(MHz)	(dBi)		
Antenna information for Bluetooth-LE				
PCB Antenna	2402~ 2480	1.13		
Antenna information for 5GHz wireless				
PCB Antenna	5180-5240MHz & 5736-5814MHz	2.00		



2. RF Exposure Evaluation

2.1. Test Limits

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

Limits For Maximum Permissible Exposure (MPE)

Frequency Range	Electric Field	Magnetic Field	Power Density	Average Time		
(MHz)	Strength (V/m)	Strength (A/m)	(mW/cm ²)	(Minutes)		
	(A) Limits fo	r Occupational/ Contro	ol Exposures			
0.3-3.0	614	1.63	*(100)	≤6		
3.0-30	1842/f	4.89/f	*(900/f ²)	<6		
30-300	61.4	0.163	1.0	<6		
300-1,500			f/300	<6		
1,500-100,000			5	<6		
	(B) Limits for General Population/ Uncontrolled Exposures					
0.3-1.34	614	1.63	*(100)	<30		
1.34-30	824/f	2.19/f	*(180/f²)	<30		
30-300	27.5	0.073	0.2	<30		
300-1,500			f/1500	<30		
1,500-100,000			1.0	<30		

f= frequency in MHz. * = Plane-wave equivalent power density.



2.2. MPE Exemptions

For single RF sources (i.e., any single fixed RF source, mobile device, or portable device, as defined in paragraph §1.1307(b)(2) of this section): A single RF source is exempt if:

(Option A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in paragraph §1.1307(b)(3)(ii)(A) of this section.

Medical implant devices may only use this exemption and that in paragraph §1.1307(b)(3)(ii)(A);

(Option B) Or the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold P (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). P is given by:

$$P th(mW) = \{ERP_{20cm}(d / 20cm)^x d \le 20cm\}$$

$$P th(mW) = \{ERP_{20cm} 20cm < d \le 40cm$$

Where

$$x = -\log_{10}\left(\frac{60}{ERP_{20cm}\sqrt{f}}\right)$$
 and f is in GHz;

and

$$ERP_{20cm}(mW) = \{2040f \ 0.3GHz \le f < 1.5GHz \}$$

$$ERP_{20cm}(mW) = \{3060 \ 1.5GHz \le f \le 6GHz\}$$

(Option C) Or using Table 1 and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP 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 (1.64 linear value).



Table 1 to §1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source Frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1920R ²
1.34-30	3450R ² /f ²
30-300	3.83R ²
300-1,500	0.0128R ² f
1,500-100,000	19.2R ²

For multiple RF sources: Multiple RF sources are exempt if:

(A) The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required). This exemption may not be used in conjunction with other exemption criteria other than those is paragraph §1.1307(b)(3)(i)(A) of this section. Medical implant devices may only use this exemption and that in paragraph §1.1307(b)(3)(i)(A).

(B) in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^{a} \frac{P_i}{P_{th,i}} + \sum_{j=1}^{b} \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^{c} \frac{Evaluated_k}{Exposure\ Limit_k} \le 1$$

Where:

a = number of fixed, mobile, or portable RF sources claiming exemption using paragraph §1.1307(b)(3)(i)(B) of this section for P_{th} , including existing exempt transmitters and those being added.

 \boldsymbol{b} = number of fixed, mobile, or portable RF sources claiming exemption using paragraph §1.1307(b)(3)(i)(C) of this section for Threshold ERP, including existing exempt transmitters and those being added.

c = number of existing fixed, mobile, or portable RF sources with known evaluation for the specified minimum distance including existing evaluated transmitters.

 P_i = the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source i at a distance between 0.5 cm and 40 cm (inclusive).

 $P_{th,i}$ = the exemption threshold power (P_{th}) according to paragraph §1.1307(b)(3)(i)(B) of this section for fixed,



mobile, or portable RF source i.

 ERP_j = the ERP of fixed, mobile, or portable RF source j.

 $ERP_{th,j}$ = exemption threshold ERP for fixed, mobile, or portable RF source j, at a distance of at least $\lambda/2\pi$ according to the applicable formula of paragraph §1.1307(b)(3)(i)(C) of this section.

Evaluated_k = the maximum reported SAR or MPE of fixed, mobile, or portable RF source k either in the device or at the transmitter site from an existing evaluation at the location of exposure.

Exposure Limit_k = either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable RF source k, as applicable from $\S 1.1310$ of this chapter.



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2.3. Calculated Result

Product	SX Subwoofer
Test Item	RF Exposure Evaluation

Wireless Specification	Frequency Band (MHz)	Tune-up Conducted Output Power (dBm)	Antenna Gian (dBi)	ERP (dBm)
BLE-1Mbps	2402 - 2480	1.00	1.13	-0.02
5GHz Wireless	5180 ~ 5240 5736 ~ 5814	16.95	2.00	49.55

Note:

- 1. Tune-up power for BLE is from the operation description.
- 2. Tune-up power for 5GHz wireless is from the certified module.
- 3. BLE and 5GHz wireless cannot transmit simultaneously.

For single RF source, Option B

Wireless Specification	Frequency Band (MHz)	R (cm)	Tune-up Conducted Output Power (mW)	Threshold (mW)	
BLE-1Mbps	2402 - 2480	20	1.26	3060	
5GHz Wireless	5180 ~ 5240 5736 ~ 5814	20	49.55	3060	
Note: R = 20cm is from the user manual.					

Therefore, the device qualifies for RF SAR-based exemption.