RF EXPOSURE EVALUATION REPORT

Application No.:	GZCR2111021339AT
Applicant:	Harman International Industries, Incorporated
Address of Applicant:	8500 Balboa Blvd, Northridge, CA 91329, UNITED STATES
Manufacturer:	Harman International Industries, Incorporated
Address of Manufacturer:	8500 Balboa Blvd, Northridge, CA 91329, UNITED STATES
Factory:	Zhong Shan City Richsound Electronic Industrial Ltd.
Address of Factory:	No.16, East Shagang Road, Gangkou, Zhongshan, Guangdong, China.
Equipment Under Test (EUT):	
EUT Name:	2.1 Soundbar with wireless Subwoofer and virtual Atmos
Model No.:	CINEMA SB190, CINEMA SB290, CINEMA SB291, CINEMA SB390, CINEMA SB391, CINEMA SB490, CINEMA SB491 ♣
♣	Please refer to section 2 of this report which indicates which item was actually tested and which were electrically identical.
Trade Mark:	JBL
Standard(s) :	47 CFR Part 1.1310
	KDB447498D01 General RF Exposure Guidance v06
Date of Receipt:	2021-11-03
Date of Evaluation:	2021-11-26 to 2021-12-29
Date of Issue:	2022-01-18
Evaluation Result:	**Pass***

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

Kobe Jian
EMC Laboratory Manager

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2022-01-18		Original

Authorized for issue by				
		 **Curry Wu/Project Engineer**		
		 **Ricky Liu/Reviewer**		

2 Evaluation Summary

Note:

E.U.T./EUT means Equipment Under Test.

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.

¤ Declaration of EUT Family Grouping:

Model No.: CINEMA SB190, CINEMA SB290, CINEMA SB291, CINEMA SB390, CINEMA SB391, CINEMA SB490, CINEMA SB491

According to the declaration from the applicant, the electrical circuit design, layout, components used and internal wiring were identical for all models, with only difference on model name.

Therefore only one model CINEMA SB190 was evaluated in this report.

3 Contents

4 General Information

4.1 Details of E.U.T.

Power supply: For soundbar
AC100-240V 50/60Hz 30W
USB output DC5V 500mA
For subwoofer
AC 100-240V 50/60Hz
For IR remote control
DC 3V （Size 'AAA' battery x 2）

Cable(s): about 1.5m unscreened AC mains cable x2
about 1m HDMI cable x1

Bluetooth:

Operation Frequency: 2402MHz to 2480MHz
Modulation Type: GFSK, pi/4DQPSK, 8DPSK
Number of Channels: 79
Channel Spacing: 1MHz
Spectrum Spread Technology: Frequency Hopping Spread Spectrum(FHSS)
Antenna Type: Integral Antenna
Antenna Gain: 2 dBi declared by applicant

2.4GHz:

Operation Frequency: 2406 to 2474 MHz
Number of Channels: 16
Channel Spacing: /
Antenna Type: Integral Antenna
Antenna Gain: 3dBi

Chanel list:

Operation Frequency each of channel							
Channel	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**
1	2406.00	6	2426.00	11	2454.00	16	2474.00
2	2410.00	7	2438.00	12	2458.00		
3	2414.00	8	2442.00	13	2462.00		
4	2418.00	9	2446.00	14	2466.00		
5	2422.00	10	2450.00	15	2470.00		

4.2 Evaluating Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,

198 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District, Guangzhou, China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.

4.3 Facility

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

- **NVLAP (Lab Code: 200611-0)**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

- **ACMA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian/New Zealand Regulatory Compliance Mark (RCM).

- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

- **CNAS (Lab Code: L0167)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2018 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2017 General Requirements) for the Competence of Testing Laboratories.

- **FCC Recognized Accredited Test Firm(Registration No.: 486818)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818.

- **ISED (Registration No.: 4620B, CAB identifier: CN0052)**

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

- **VCCI (Registration No.: R-12460, C-12584, G-20107 and T-11179)**

The 10m Semi-anechoic chamber, 966 Anechoic Chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-12460, C-12584, G-20107 and T-11179 respectively.

- **CBTL (Lab Code: TL129)**

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2017, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

4.4 Deviation from Standards

None

4.5 Abnormalities from Standard Conditions

None

5 Technical Requirements Specification

5.1 General Description of Applied Standards

KDB447498D01 General RF Exposure Guidance v06

4.3.1. Standalone SAR test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions,

by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

5.2 RF Exposure Evaluation

5.2.1 Limit & Test Method

According to FCC Part1.1310: 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 part1.1307(b)

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled 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
300–1500	.....	.....	f/300	6
1500–100,000	.....	.....	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f^2)	30
30–300	27.5	0.073	0.2	30
300–1500	.....	.....	f/1500	30
1500–100,000	.....	.....	1.0	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: $P_d = (P_{out}*G)/(4* P_i * R^2)$

Where

P_d = power density in mW/cm^2

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

P_i = 3.1416

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

P_d id the limit of MPE, 1 mW/cm^2. If we know the maximum gain of the antenna and the total power input to

the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

5.2.2 Conclusion

Normal use condition for Distance between antenna and body:	>=20cm declared by applicant
Antenna Gain:	2 dBi for bluetooth 3 dBi for 2.4 GHz self defined

For 2.4GHz self defined

Frequency (MHz)	Antenna Gain (Numeric)	Peak Output Level@3m (dBuV/m)	Peak Output Level@0.2m (dBuV/m)*	Peak Output Power (mW)**	Power Density (S) (mW/cm^2)	Limit of Power Density (S) (mW/cm^2)	Test Result
2406	1.995	91.31	114.84	0.20	0.00008	1	Complies
2442	1.995	91.37	114.89	0.21	0.00008	1	Complies
2474	1.995	91.67	115.19	0.22	0.00009	1	Complies

*Remark: Peak Output Level@0.2m (dBuV/m)=Peak Output Level@3m (dBuV/m)+20log(3/0.2)

**Remark: Peak Output Power (mW)= (Peak Output Level@0.2m (V/m)*0.2)^2/(30*1.995)

For Bluetooth Classic

Frequency (MHz)	Antenna Gain (Numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm^2)	Limit of Power Density (S) (mW/cm^2)	Test Result
2402	1.585	0.39	1.094	0.00034	1	Complies
2441	1.585	0.83	1.211	0.00038	1	Complies
2480	1.585	1.16	1.306	0.00052	1	Complies

The Bluetooth and Wi-Fi can be transmitted together, the result is

0.00052/1 + 0.00009/1 =0.00061 < 1.0

So SAR report is not required.

Note: Refer to report No. GZCR211102133902 for EUT test Max Conducted Peak Output Power value & GZCR211102133903 for EUT test Max Field Strength of the Fundamental Signal value.

6 EUT Constructional Details (EUT Photos)

Refer to External and Internal Photos for GZCR2111021339AT

- End of the Report -

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