RF EXPOSURE REPORT

Report No.: 18070747-FCC-H

Applicant	Circus World Displays Limited
Product Name	Powered Bookshelf Speaker
Model No.	Ai60
Serial No.	N/A
Test Standard	FCC 2.1091
Test Date	July 19 to 26, 2018
Issue Date	July 27, 2018
Test Result	☑ Pass ☐ Fail
Equipment complied with the specification	☑
Equipment did not comply with the specification	☐

Aaron Liang	David Huang	
Aaron Liang Test Engineer	David Huang Checked By	

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Test result presented in this test report is applicable to the tested sample only

Issued by:

SIEMIC (SHENZHEN-CHINA) LABORATORIES

Zone A, Floor 1, Building 2 Wan Ye Long Technology Park

South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108

Phone: +86 0755 2601 4629801 Email: China@siemic.com.cn

Laboratories Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.

In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Scope
USA	EMC, RF/Wireless, SAR, Telecom
Canada	EMC, RF/Wireless, SAR, Telecom
Taiwan	EMC, RF, Telecom, SAR, Safety
Hong Kong	RF/Wireless, SAR, Telecom
Australia	EMC, RF, Telecom, SAR, Safety
Korea	EMI, EMS, RF, SAR, Telecom, Safety
Japan	EMI, RF/Wireless, SAR, Telecom
Singapore	EMC, RF, SAR, Telecom
Europe	EMC, RF, SAR, Telecom, Safety

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1. Report Revision History

Report No.	Report Version	Description	Issue Date
18070747-FCC-H	NONE	Original	July 27, 2018

2. Customer information

Applicant Name	Circus World Displays Limited
Applicant Add	4080 Montrose Rd Niagara Falls Canada L2H 1J9
Manufacturer	Circus World Displays Limited
Manufacturer Add	4080 Montrose Rd Niagara Falls Canada L2H 1J9

3. Test site information

Lab performing tests	SIEMIC (Shenzhen-China) LABORATORIES
Lab Address	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108
FCC Test Site No.	535293
IC Test Site No.	4842E-1
Test Software	Labview of SIEMIC version 2.0

4. Equipment under Test (EUT) Information

Description of EUT:	Powered Bookshelf Speaker
Main Model:	Ai60
Serial Model:	N/A
Equipment Category：	DSS
Antenna Gain:	Bluetooth/BLE: 0dBi
Antenna Type:	PCB antenna
Input Power:	Adapter: Model: DQS751-240300-3 INPUT: AC 100-240V~50/60Hz, 2.0A Max OUTPUT: DC 24V, 3.0A
Trade Name :	Fluance
FCC ID:	SMHAI60
Type of Modulation:	Bluetooth: GFSK, π /4DQPSK, 8DPSK BLE: GFSK
RF Operating Frequency (ies):	Bluetooth& BLE: 2402-2480 MHz
Number of Channels:	Bluetooth: 79CH BLE: 40CH
Port:	Please refer to the user’ s manual
Date EUT received:	July 18, 2018
Test Date(s):	July 19 to 26, 2018

5. FCC §2.1091 - Maximum Permissible exposure (MPE)

6.1 Applicable Standard

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission' s guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for General Population/Uncontrolled Exposure

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minutes)
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

* = Plane-wave equivalent power density

6.2 Test Result

Bluetooth:

Type	Test mode	CH	Freq (MHz)	Conducted Power (dBm)	Tune Up Power (dBm)
Output power	GFSK	Low	2402	1.607	2±1
		Mid	2441	2.263	2±1
		High	2480	1.851	2±1
	π /4 DQPSK	Low	2402	0.769	1±1
		Mid	2441	1.903	1±1
		High	2480	1.985	1±1
	8DPSK	Low	2402	1.023	1±1
		Mid	2441	1.754	1±1
		High	2480	1.795	1±1

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

Where: S = power density (in appropriate units, e.g. mW/cm^2)

P = power input to the antenna (in appropriate units, e.g., mW).

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

For the antenna manufacturer provide only used limited to ERP/EIRP or radiated spurious emission test. The MPE evaluation as below:

Maximum output power at antenna input terminal: 3(dBm)

Maximum output power at antenna input terminal: 1.995(mW)

Prediction distance: >20 (cm)

Predication frequency: 2441(MHz) Middle frequency

Antenna Gain (typical): 0(dBi)

The worst case is power density at predication frequency at 20 cm: 0.0004(mW/cm^2)

MPE limit for general population exposure at prediction frequency: 1.0(mW/cm^2)

$0.0004(mW/cm^2) < 1 (mW/cm^2)$

BLE:

Type	Test mode	CH	Freq (MHz)	Conducted Power (dBm)	Tune Up Power (dBm)
Output power	GFSK	Low	2402	1.790	2±1
		Mid	2440	1.990	2±1
		High	2480	2.257	2±1

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

Where: S = power density (in appropriate units, e.g. mW/cm^2)

P = power input to the antenna (in appropriate units, e.g., mW).

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

For the antenna manufacturer provide only used limited to ERP/EIRP or radiated spurious emission test. The MPE evaluation as below:

Maximum output power at antenna input terminal: 3(dBm)

Maximum output power at antenna input terminal: 1.995(mW)

Prediction distance: >20 (cm)

Predication frequency: 2480(MHz) High frequency

Antenna Gain (typical): 0(dBi)

The worst case is power density at predication frequency at 20 cm: 0.0004(mW/cm^2)

MPE limit for general population exposure at prediction frequency: 1.0(mW/cm^2)

0.0004(mW/cm^2) < 1 (mW/cm^2)

Result: Pass