

# TEST REPORT

**Product Name** : OTT+Speaker  
**Brand Mark** : N/A  
**Model No.** : SEI810CCOA  
**FCC ID** : 2AOVU-SK330LA  
**Report Number** : BLA-EMC-202112-A7606  
**Date of Sample Receipt** : 2021/12/16  
**Date of Test** : 2021/12/16 to 2022/1/13  
**Date of Issue** : 2022/1/13  
**Test Standard** : 47 CFR Part 1.1307, Part 2.1093, KDB  
447498  
**Test Result** : Pass

Prepared for:

**Shenzhen SEI Robotics Co., Ltd.**

**4th Floor, Productivity Building D, #5 Hi-Tech Middle 2nd Road, Shenzhen  
Hi-Tech Industrial Park, Nanshan District, Shenzhen, China**

Prepared by:

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Date:

2022/1/13



**REPORT REVISE RECORD**

<b>Version No.</b>	<b>Date</b>	<b>Description</b>
00	2022/1/13	Original
01	2022/1/14	Model no. change form SK330LA to SEI810CCOA

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## 1 TEST SUMMARY

Test item	Test Requirement	Test Method	Class/Severity	Result
RF Exposure	47 CFR Part 1.1307, Part 2.1093, KDB 447498	CFR 47 Part 2.1093	CFR 47 Part 2.1093	Pass

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## 2 GENERAL INFORMATION

<b>Applicant</b>	Shenzhen SEI Robotics Co., Ltd.
<b>Address</b>	4th Floor, Productivity Building D, #5 Hi-Tech Middle 2nd Road, Shenzhen Hi-Tech Industrial Park, Nanshan District, Shenzhen, China
<b>Manufacturer</b>	Shenzhen SEI Robotics Co., Ltd.
<b>Address</b>	4th Floor, Productivity Building D, #5 Hi-Tech Middle 2nd Road, Shenzhen Hi-Tech Industrial Park, Nanshan District, Shenzhen, China
<b>Factory</b>	Shenzhen SEI Robotics Co., Ltd.
<b>Address</b>	4th Floor, Productivity Building D, #5 Hi-Tech Middle 2nd Road, Shenzhen Hi-Tech Industrial Park, Nanshan District, Shenzhen, China
<b>Product Name</b>	OTT+Speaker
<b>Test Model No.</b>	SEI810CCOA

## 3 GENERAL DESCRIPTION OF E.U.T.

<b>Hardware Version</b>	SMB.263.08
<b>Software Version</b>	v10.8.245
<b>Operation Frequency:</b>	2402MHz-2480MHz
<b>Modulation Type:</b>	GFSK, pi/4DQPSK, 8DPSK
<b>Channel Spacing:</b>	1MHz
<b>Number of Channels:</b>	79
<b>Antenna Type:</b>	Internal Antenna
<b>Antenna Gain:</b>	5dBi(Provided by the applicant)

<b>Operation Frequency:</b>	2402MHz-2480MHz
<b>Modulation Type:</b>	GFSK
<b>Channel Spacing:</b>	2MHz
<b>Number of Channels:</b>	40
<b>Antenna Type:</b>	Internal Antenna
<b>Antenna Gain:</b>	5dBi(Provided by the applicant)

<b>Operation Frequency:</b>	802.11b/g/n(HT20): 2412MHz to 2462MHz 802.11n(HT40): 2422MHz to 2452MHz
<b>Modulation Type:</b>	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
<b>Channel Spacing:</b>	5MHz
<b>Number of Channels:</b>	802.11b/g/n(HT20):11 802.11n(HT40):7
<b>Antenna Type:</b>	Internal Antenna
<b>Antenna Gain:</b>	5dBi(Provided by the applicant)

<b>Operation Frequency:</b>	Band 1 : 5180MHz-5240MHz; Band 4 : 5745MHz-5825MHz
<b>Channel numbers:</b>	Band 1: 802.11a/802.11n(HT20)/802.11ac(HT20): 4, 802.11n(HT40)/802.11ac(HT40):2, 802.11ac(HT80): 1 Band 4: 802.11a/802.11(HT20)/802.11ac(HT20): 5, 802.11n(HT40)/802.11ac(HT40): 2, 802.11ac(HT80): 1
<b>Channel separation:</b>	802.11a/n/ac(HT20): 20MHz, 802.11n/ac(HT40): 40MHz, 802.11ac(HT80): 80MHz
<b>Modulation technology: (IEEE 802.11a/n/ac)</b>	BPSK, QPSK, 16-QAM, 64-QAM, 256QAM
<b>Data speed(IEEE 802.11a)</b>	6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps, 54Mbps
<b>Data speed (IEEE 802.11n/ac):</b>	Up to 866.7Mbps
<b>Antenna Type:</b>	Internal antenna
<b>Antenna gain:</b>	5dBi(Provided by the applicant)
<b>Note:</b>	Antenna number : 2 SISO mode: 802.11a MIMO mode: 802.11n(HT20)/ 802.11n(HT40)/ 802.11ac(HT20)/ 802.11ac(HT40)/ 802.11ac(HT80) Directional gain of MIMO mode: $5+10\log_2=8.01$ dBi
Remark: The Antenna Gain is supplied by the customer. BlueAsia is not responsible for this data	

#### 4 LABORATORY LOCATION

All tests were performed at:  
BlueAsia of Technical Services(Shenzhen) Co., Ltd.  
Building C, No. 107, Shihuan Road, Shiyan Sub-District, Baoan District, Shenzhen, Guangdong Province,  
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Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673  
No tests were sub-contracted.

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## 5 RF EXPOSURE COMPLIANCE REQUIREMENT

### 5.1 LIMITS

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 <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposures</b>				
0.3–3.0 .....	614	1.63	*(100)	6
3.0–30 .....	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30–300 .....	61.4	0.163	1.0	6
300–1500 .....	.....	.....	f/300	6
1500–100,000 .....	.....	.....	5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3–1.34 .....	614	1.63	*(100)	30
1.34–30 .....	824/f	2.19/f	*(180/f <sup>2</sup> )	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:  $Pd = (Pout * G) / (4 * \pi * R^2)$

Where

Pd = power density in mW/cm<sup>2</sup>

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

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

Pd is the limit of MPE, 1 mW/cm<sup>2</sup>. 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 TEST PROCEDURE

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.



### 5.3 EUT RF EXPOSURE EVALUATION

**Antenna Gain:** BLE/2.4G WIFI/5G WIFI:5dBi

**Antenna Gain:** The maximum Gain measured in fully anechoic chamber is 3.16 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

BLE:

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit	Result
lowest	2402	-1.07	0.781628	0.00049	1.0	PASS

BDR :GFSK (worst case)

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit	Result
Middle	2441	5.18	3.296097	0.00207	1.0	PASS

2.4GWIFI:802.11N40 (worst case)

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit	Result
lowest	2422	10.09	10.20939	0.00642	1.0	PASS

5G wifi:802.11N20 (worst case)

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit	Result
lowest	5240	14.33	27.10192	0.01705	1.0	PASS

**Note:** Refer to report No. BLA-EMC-202112-A7602/03/04/05 for EUT test Max Conducted Peak Output Power value. The distance r (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation Requirement

**----END OF REPORT----**

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