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Report No.: SHEM160900595104

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1 Cover Page

FCC MPE REPORT

Application No.:	SHEM1609005951CR
Applicant:	Shanghai PartnerX Robotics Co.,Ltd
FCC ID:	2AJ5L-M
IC ID:	22130-M
Equipment Under Test (EUT):	
NOTE: The following sample(s) submitted was/were identified on behalf of the client as	
Product Name:	Abilix Educational Robot Mobile Series
Model No.(EUT):	Oculus 5, Oculus 3, Oculus 4, Oculus 6
Standards:	FCC Rules 47 CFR §2.109 RSS-102 Issue 5: 2015 KDB447498 D01 General RF Exposure Guidance v06
Date of Receipt:	2016-9-9
Date of Test:	2016-9-9 to 2016-11-30
Date of Issue:	2016-12-23
Test Result:	Pass*

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



Parlam Zhan
E&E Section Manager
SGS-CSTC (Shanghai) Co., Ltd.

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

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. All test results in this report can be traceable to National or International Standards.

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3 General Information

3.1 Client Information

Applicant:	Shanghai PartnerX Robotics Co.,Ltd
Address of Applicant:	8 th Floor, Building 90, No.1122 North Qinzhou Rd. Shanghai, China 200233
Manufacturer:	Shanghai PartnerX Robotics Co.,Ltd
Address of Manufacturer:	8 th Floor, Building 90, No.1122 North Qinzhou Rd. Shanghai, China 200233
Factory:	Shanghai PartnerX Robotics Co.,Ltd
Address of Factory:	The west side of 2nd Floor, Building 9, o.628 Jiuxin Highway, Shanghai, China 201615

3.2 General Description of E.U.T.

Power supply:	DC 11.1V 3000mAh rechargeable Li-ion battery Adapter 1:X126020:input AC100-240V 50/60Hz 1A; output:DC12.6V 2A Adapter 2:XSG1261800EU:input AC100-240V 50/60Hz 0.6Amax;output DC12.6V 1.8A
Trade Mark	Abilix

3.3 Details of E.U.T.

Operation Frequency:	WiFi: 2412MHz~2462MHz
Modulation Technique:	802.11g/n: OFDM(64QAM, 16QAM, QPSK, BPSK)
Number of Channel:	802.11 b/g/n(HT20): 11 802.11 n(HT40): 7
Antenna Type	Integral
Antenna Gain	-1dBi

3.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

No.588 West Jindu Road, Songjiang District, Shanghai, China.201612.

Tel: +86 21 6191 5666

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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 17025:2005 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. Date of expiry: 2017-07-14.

- FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2017-09-16.

- Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A-1. Expiry Date: 2017-06-18.

- 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-3868, C-4336, T-2221, G-830 respectively. Date of Expiry: 2017-11-16.

4 Test Standards and Limits

According to §1.1310 Radiofrequency radiation exposure limits:

The limit for general population/uncontrolled exposures

Frequency	Power density(mW/cm ²)	Averaging time(minutes)
300MHz~1.5GHz	f/1500	30
1.5GHz~100GHz	1.0	30

According to RSS-102 section 2.5.2, RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);

- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

For 2.4G device, the limit of worse case is 2.68 W

5 Measurement and Calculation

5.1 Maximum transmit power

The Power Data is based on the RF Test Report SHEM160900595103.

For WiFi:

Test mode	Test Frequency (MHz)	Output Power (dBm)	Output Power (mW)
802.11b	2412	19.04	80.16
	2437	18.92	77.98
	2462	19.23	83.75
802.11g	2412	19.60	91.2
	2437	19.66	92.46
	2462	19.33	85.70
802.11 n(HT20)	2412	19.01	79.61
	2437	18.97	78.88
	2462	19.26	84.33
802.11 n(HT40)	2422	19.41	87.29
	2437	19.35	86.09
	2452	18.96	78.70

5.2 MPE Calculation

According to the formula $S = \frac{PG}{4R^2\pi}$, we can calculate S which is MPE.

Note:

- 1) P (Watts) = Power Input to antenna = $10^{\frac{dBm}{10}} / 1000$
- 2) G (Antenna gain in numeric) = $10^{\frac{dBi}{10}}$ (Antenna gain in dBi /10)
- 3) R = distance to the center of radiation of antenna (in meter) = 20cm
- 4) MPE limit = 1mW/cm² for FCC

For DTS:

The Max Conducted Peak Output Power is **92.46mW** in highest channel;

The best case gain of the antenna is **-1dBi**. logarithmic terms convert to numeric result is nearly 0.794

$$\text{So, } S = \frac{PG}{4R^2\pi} = 0.146 \text{ mW/cm}^2$$

According to the KDB447498 section 7.1 determine the device is exclusion from SAR test.

For IC:2.4G device, Pout<2.68W

6 EUT Constructional Details

Refer to the < Oculus 5 _External Photos > & < Oculus 5 _Internal Photos>.

--End of the Report--