



**SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch**

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RF Exposure Evaluation Report

Application No.: SZEM1809008742CR
Applicant: IAdea Corporation
Address of Applicant: 3F, No. 21 Lane 168, Xingshan Road, Neihu Dist., Taipei, Taiwan
Manufacturer: IAdea Corporation
Address of Manufacturer: 3F, No. 21 Lane 168, Xingshan Road, Neihu Dist., Taipei, Taiwan
Equipment Under Test (EUT):
Product Name: Smart Signboard
Model No.: XDS-2288/IAD-18003, XDS-22YY/IAD-18003(Note: the first Y for color & SW version, and the 2nd Y for customer models) ♣
♣ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Trade mark: IAdea
FCC ID: Y9E-IAD18003
Standards: 47 CFR Part 1.1307
47 CFR Part 2.1093
KDB447498D01 General RF Exposure Guidance v06
Date of Receipt: 2018-10-18
Date of Test: 2018-10-25 to 2018-12-12
Date of Issue: 2018-12-13

Test Result :	PASS*
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* In the configuration tested, the EUT complied with the standards specified above.



Keny Xu
EMC Laboratory Manager

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. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2018-12-13		Original

Authorized for issue by:			
			
		Leo Li /Project Engineer	
			
		Eric Fu /Reviewer	



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4 General Information

4.1 General Description of EUT

Power supply:	DC 12V from adapter input AC 120V/60Hz Adapter Model:FJ-SW1203000 Input:AC100-240V~50/60Hz 1.5A MAX Output:DC 12V 3000mA
For BLE	
Bluetooth Version:	V4.0 BLE
Operation Frequency	2402MHz to 2480MHz
Modulation Type	GFSK
Number of Channels	40
Channel Spacing	2MHz
Antenna Type	Integral Antenna
Antenna Gain	1.92dBi
For WiFi 2.4GHz	
Operation Frequency	802.11b/g/n(HT20): 2412MHz to 2462MHz
Number of Channels	802.11b/g/n(HT20):11
Modulation Type	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Channel Spacing	5MHz
Antenna Type	Integral Antenna
Antenna Gain	1.92dBi

Remark:

Model No.: XDS-2288/IAD-18003, XDS-22YY/IAD-18003(Note: the first Y for color & SW version, and the 2nd Y for customer models)

Only the model XDS-2288/IAD-18003 was tested, since the electrical circuit design, layout, components used, internal wiring and functions were identical for all the above models, with only difference on model No..



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4.2 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China
518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

4.3 Test Facility

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

• CNAS (No. CNAS L2929)

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab 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.

• A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• VCCI

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• FCC –Designation Number: CN1178

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

• Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

4.4 Deviation from Standards

None.

4.5 Abnormalities from Standard Conditions

None.

4.6 Other Information Requested by the Customer

None.



5 RF Exposure Evaluation

5.1 RF Exposure Compliance Requirement

5.1.1 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 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: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

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

P_d is the limit of MPE, 1 mW/cm². 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.

5.1.2 Test Procedure

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



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5.1.3 EUT RF Exposure Evaluation

For BLE

Antenna Gain:1.92dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.556 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
Lowest	2402	8.48	7.05	0.002	1.0	PASS

Note: Refer to report No. SZEM180900874202 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.

FOE 2.4g WiFi

Antenna Gain: 1.92dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.556 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
Hight	2462	23.65	231.74	0.072	1.0	PASS

Note: Refer to report No. SZEM180900874203 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 requiremen

- End of the Report -