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Report No.: SZEM150800484302  
Page: 1 of 7

## RF Exposure Evaluation Report

**Application No.:** SZEM1508004843CR  
**Applicant:** Arts Electronics Co., Ltd.  
**Manufacturer:** Arts Electronics Co., Ltd.  
**Factory:** Arts Electronics Co., Ltd.  
**Product Name:** PROFESSIONAL HD KARAOKE SYSTEM WITH BLUETOOTH  
**Model No.(EUT):** SDL9030DB  
**Trade Mark:** singing machine  
**FCC ID:** TZISDL9030DB  
**Standards:** 47 CFR Part 1.1307 (2014)  
47 CFR Part 1.1310 (2014)  
**Date of Receipt:** 2015-08-05  
**Date of Test:** 2015-08-10 to 2015-10-17  
**Date of Issue:** 2015-10-21

|                      |              |
|----------------------|--------------|
| <b>Test Result :</b> | <b>PASS*</b> |
|----------------------|--------------|

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

Authorized Signature:



Jack Zhang  
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.

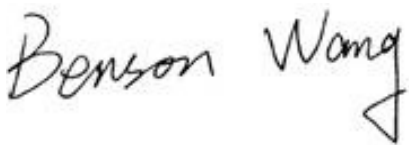
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## 2 Version

| Revision Record |         |            |          |          |
|-----------------|---------|------------|----------|----------|
| Version         | Chapter | Date       | Modifier | Remark   |
| 00              |         | 2015-10-21 |          | Original |
|                 |         |            |          |          |
|                 |         |            |          |          |

|                          |                                                                                                                         |                    |  |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------|--------------------|--|
| Authorized for issue by: |                                                                                                                         |                    |  |
| Tested By                | <br>(Benson Wang) /Project Engineer | 2015-10-17<br>Date |  |
| Prepared By              | <br>(Venus Wu) /Clerk                | 2015-10-21<br>Date |  |
| Checked By               | <br>(Eric Fu) /Reviewer              | 2015-10-21<br>Date |  |



### 3 Contents

|                                                       | Page |
|-------------------------------------------------------|------|
| 1 COVER PAGE .....                                    | 1    |
| 2 VERSION .....                                       | 2    |
| 3 CONTENTS .....                                      | 3    |
| 4 GENERAL INFORMATION .....                           | 4    |
| 4.1 CLIENT INFORMATION .....                          | 4    |
| 4.2 GENERAL DESCRIPTION OF EUT .....                  | 4    |
| 4.3 TEST LOCATION .....                               | 4    |
| 4.4 TEST FACILITY .....                               | 5    |
| 4.5 DEVIATION FROM STANDARDS .....                    | 5    |
| 4.6 ABNORMALITIES FROM STANDARD CONDITIONS .....      | 5    |
| 4.7 OTHER INFORMATION REQUESTED BY THE CUSTOMER ..... | 5    |
| 5 RF EXPOSURE EVALUATION .....                        | 6    |
| 5.1 RF EXPOSURE COMPLIANCE REQUIREMENT .....          | 6    |
| 5.1.1 Limits .....                                    | 6    |
| 5.1.2 Test Procedure .....                            | 6    |
| 4.1.3 EUT RF EXPOSURE EVALUATION .....                | 7    |



## 4 General Information

### 4.1 Client Information

|                          |                                                                                                 |
|--------------------------|-------------------------------------------------------------------------------------------------|
| Applicant:               | Arts Electronics Co., Ltd.                                                                      |
| Address of Applicant:    | NO.1, SHANGXING LU, SHANGJIAO COMMUNITY, CHANGAN TOWN, DONGGUAN CITY, GUANGDONG PROVINCE, CHINA |
| Manufacturer:            | Arts Electronics Co., Ltd.                                                                      |
| Address of Manufacturer: | NO.1, SHANGXING LU, SHANGJIAO COMMUNITY, CHANGAN TOWN, DONGGUAN CITY, GUANGDONG PROVINCE, CHINA |
| Factory:                 | Arts Electronics Co., Ltd.                                                                      |
| Address of Factory:      | NO.1, SHANGXING LU, SHANGJIAO COMMUNITY, CHANGAN TOWN, DONGGUAN CITY, GUANGDONG PROVINCE, CHINA |

### 4.2 General Description of EUT

|                   |                                                                                                                                                          |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Name:     | PROFESSIONAL HD KARAOKE SYSTEM WITH BLUETOOTH                                                                                                            |
| Model No.:        | SDL9030DB                                                                                                                                                |
| Trade Mark:       | singing machine                                                                                                                                          |
| Bluetooth Version | V2.1+EDR                                                                                                                                                 |
| Sample Type:      | Fixed production                                                                                                                                         |
| Modulation Type:  | GFSK , $\pi/4$ QPSK , 8DPSK                                                                                                                              |
| Antenna Gain:     | 0dBi                                                                                                                                                     |
| Antenna Type:     | Integral                                                                                                                                                 |
| EUT Power Supply: | Adapter Model: GFP451-1530BX-1<br>Input: AC 100-240V 50-60Hz 1.2A<br>Output: DC 15V 3A<br>Internal rechargeable battery: DC 12V 7Ah<br>Charge by adapter |

### 4.3 Test Location

All tests were performed at:

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

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.



#### **4.4 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 10m Semi-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.: G-823, R-4188, T-1153 and C-2383 respectively.

- **FCC – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 556682.

- **Industry Canada (IC)**

The 3m Semi-anechoic chambers and the 10m Semi-anechoic chambers of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-2, 4620C-3.

#### **4.5 Deviation from Standards**

None.

#### **4.6 Abnormalities from Standard Conditions**

None.

#### **4.7 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<br>(MHz)                                       | Electric field<br>strength<br>(V/m) | Magnetic field<br>strength<br>(A/m) | Power density<br>(mW/cm <sup>2</sup> ) | Averaging time<br>(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:  $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = 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

$P_d$  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.

#### 5.1.2 Test Procedure

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



#### 4.1.3 EUT RF Exposure Evaluation

Antenna Gain: 0dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

| Channel | Frequency<br>(MHz) | Max Conducted<br>Peak Output<br>Power (dBm) | Output Power<br>to Antenna<br>(mW) | Power Density<br>at R = 20 cm<br>(mW/cm <sup>2</sup> ) | Limit | Result |
|---------|--------------------|---------------------------------------------|------------------------------------|--------------------------------------------------------|-------|--------|
| Lowest  | 2402               | -2.68                                       | 0.540                              | 0.0001                                                 | 1.0   | PASS   |

Note: Refer to report No. SZEM150800484301 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.