# RF EXPOSURE REPORT

| | |
|---|---|
| **Report No.:** | SET2016-15835 |
| **Product Name:** | Buttons |
| **FCC ID:** | 2AB2S-IAMEP2001 |
| **IC:** | 20547-IAMEP2001 |
| **Model No. :** | IAMEP2001 |
| **Applicant:** | i.am.plus,LLC |
| **Address：** | 10960 Wilshire Blvd., 5th Floor, Los Angeles, California 90024, United States |
| **Dates of Testing:** | 08/10/2016 — 08/23/2016 |
| **Issued by:** | SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO. LTD. |
| **Lab Location:** | Electronic Testing Building, Shahe Road, Xili, Nanshan District, Shenzhen, 518055, P. R. China<br>**Tel:** 86 755 26627338 **Fax:** 86 755 26627238 |

# Test Report

| | |
|---|---|
| **Product Name ..... :** | Buttons |
| **Brand Name ..... :** | i.am+ |
| **Trade Name ..... :** | i.am+ |
| **Applicant ..... :** | i.am.plus,LLC |
| **Applicant Address ..... :** | 10960 Wilshire Blvd., 5th Floor, Los Angeles, California 90024, United States |
| **Manufacturer ..... :** | Shenzhen Grandsun Electronic Co., Ltd. |
| **Manufacturer Address ..... :** | East Park,Gaoqiao Industry Zone,Pingdi Street, Longgang, Shenzhen City, Guangdong Province, P.R China |
| **Test Standards ..... :** | FCC Part 2 (Section 2.1093)<br>KDB 447498<br>RSS-102 |
| **Test Result ..... :** | PASS |
| **Tested by ..... :** | 2016.08.23<br>Lu Lei, Test Engineer |
| **Reviewed by ..... :** | 2016.08.23<br>Zhu Qi, Senior Egineer |
| **Approved by ..... :** | 2016.08.23<br>Wu Li'an, Manager |

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| Change History | | |
|---|---|---|
| Issue | Date | Reason for change |
| 1.0 | 2016.08.23 | First edition |
| | | |
| | | |

# 1. General Information

## 1.1. EUT Description

| | |
|---|---|
| EUT Type | Buttons |
| Hardware Version | 1.0 |
| Software Version | 1.0 |
| EUT supports Radios application | Bluetooth EDR |
| Frequency Range | 2402MHz~2480MHz |
| Channel Number | 79 |
| Bit Rate of Transmitter | 1/2/3Mbps |
| Modulation Type | GFSK, π /4-DQPSK,8DPSK |
| Antenna Type | Ceramic Antenna |
| Antenna Gain | 2dBi |

## 1.2. Test Facilities

**CNAS-Lab Code: L1225**

SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO. LTD. Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories

(identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories, Date of Registration: February 28, 2015. Valid time is until February 27, 2018.

**FCC-Registration No.: 317478**

SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO. LTD. Co., Ltd. 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 317478, Renewal date Jul. 18, 2014, valid time is until Jul. 18, 2017.

**IC-Registration No.: 5377B**

Two 3m Alternate Test Site of SHENZHEN HUATONGWEI INTERNATIONAL INSPECTION CO. LTD. Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377B on Dec.03, 2014, valid time is until Dec.03, 2017.

# 2. RF Exposure for FCC

## 2.1. Exposure Limited for FCC

According to KDB447498 D01 General RF Exposure Guidance v05r01Section 4.3.1 Standalone SAR test exclusion considerations:“ Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Test Exclusion Threshold condition, listed below, is satisfied. These test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.22 The minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander (see 5) of section 4.1). To qualify for SAR test exclusion, the test separation distances applied must be fully explained and justified by the operating configurations and exposure conditions of the transmitter and applicable host platform requirements, typically in the SAR measurement or SAR analysis report, according to the required published RF exposure KDB procedures. When no other RF exposure testing or reporting is required, a statement of justification and compliance must be included in the equipment approval, in lieu of the SAR report, to qualify for the SAR test exclusion. When required, the device specific conditions described in the other published RF exposure KDB procedures must be satisfied before applying these SAR test exclusion provisions; for example, handheld PTT two-way radios, handsets, laptops & tablets etc.23 “[(max. power of channel, including tune-up tolerance, mW)/ (min. test separation distance, mm)] · [√f (GHz)]≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where:

• f (GHz) is the RF channel transmit frequency in GHz
• Power and distance are rounded to the nearest mW and mm before calculation
• The result is rounded to one decimal place for comparison
• 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is <5 mm, a distance of 5 mm according to 5) in section 4.1 is applied to determine SAR test exclusion.

## 2.2. Result and Assessment

### Conducted Power Results

| GFSK mode | | | |
|---|---|---|---|
| Channel | Channel 0 | Channel 39 | Channel 78 |
| Output Power (dBm) | 3.16 | 3.02 | 3.15 |

| π/4-DQPSK mode | | | |
|---|---|---|---|
| Channel | Channel 0 | Channel 39 | Channel 78 |
| Output Power (dBm) | 2.56 | 2.71 | 2.63 |

| 8- DPSK mode | | | |
|---|---|---|---|
| Channel | Channel 0 | Channel 39 | Channel 78 |
| Output Power (dBm) | 2.46 | 2.54 | 2.38 |

### Manufacturing tolerance

| GFSK mode | | | |
|---|---|---|---|
| Channel | Channel 0 | Channel 39 | Channel 78 |
| Target (dBm) | 3 | 3 | 3 |
| Tolerance ±(dB) | 0.5 | 0.5 | 0.5 |

| π/4-DQPSK mode | | | |
|---|---|---|---|
| Channel | Channel 0 | Channel 39 | Channel 78 |
| Target (dBm) | 3 | 3 | 3 |
| Tolerance ±(dB) | 0.5 | 0.5 | 0.5 |

| 8- DPSK mode | | | |
|---|---|---|---|
| Channel | Channel 0 | Channel 39 | Channel 78 |
| Target (dBm) | 2.5 | 2.5 | 2.5 |
| Tolerance ±(dB) | 0.5 | 0.5 | 0.5 |

### Evaluation Results

| GFSK mode | | | | | |
|---|---|---|---|---|---|
| Frequency | Antenna Distance （mm） | RF output power (including tune-up tolerance) | | SAR Test Exclusion Threshold | SAR Test Exclusion |
| | | dBm | mW | | |
| 2402MHz | 5 | 3.5 | 2.24 | 0.7＜3.0 | Yes |
| 2441MHz | 5 | 3.5 | 2.24 | 0.7＜3.0 | Yes |

| | | | | | |
|---|---|---|---|---|---|
| 2480MHz | 5 | 3.5 | 2.24 | 0.7＜3.0 | Yes |

| π/4-DQPSK mode | | | | | |
|---|---|---|---|---|---|
| Frequency | Antenna Distance （mm） | RF output power (including tune-up tolerance) | | SAR Test Exclusion Threshold | SAR Test Exclusion |
| | | dBm | mW | | |
| 2402MHz | 5 | 3.5 | 2.24 | 0.7＜3.0 | Yes |
| 2441MHz | 5 | 3.5 | 2.24 | 0.7＜3.0 | Yes |
| 2480MHz | 5 | 3.5 | 2.24 | 0.7＜3.0 | Yes |

| GFSK mode | | | | | |
|---|---|---|---|---|---|
| Frequency | Antenna Distance （mm） | RF output power (including tune-up tolerance) | | SAR Test Exclusion Threshold | SAR Test Exclusion |
| | | dBm | mW | | |
| 2402MHz | 5 | 3 | 2.00 | 0.6＜3.0 | Yes |
| 2441MHz | 5 | 3 | 2.00 | 0.6＜3.0 | Yes |
| 2480MHz | 5 | 3 | 2.00 | 0.6＜3.0 | Yes |

**Conclusion**

The measurement results comply with the FCC Limit per 47 CFR 2.1093 for the uncontrolled RF Exposure and SAR Exclusion Threshold per KDB 447498 v05r02.

# 3. RF Exposure for IC

## 3.1. Exposure Limited for IC

RSS-210 Section 2.5.1 **Exemption Limits for Routine Evaluation – SAR Evaluation**
SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance defined in Table 1.

**Table 1: SAR evaluation – Exemption limits for routine evaluation based on frequency and separation distance**

| Frequency (MHz) | Exemption Limits (mW) | | | | |
|---|---|---|---|---|---|
| | At separation distance of ≤5 mm | At separation distance of 10 mm | At separation distance of 15 mm | At separation distance of 20 mm | At separation distance of 25 mm |
| ≤300 | 71 mW | 101 mW | 132 mW | 162 mW | 193 mW |
| 450 | 52 mW | 70 mW | 88 mW | 106 mW | 123 mW |
| 835 | 17 mW | 30 mW | 42 mW | 55 mW | 67 mW |
| 1900 | 7 mW | 10 mW | 18 mW | 34 mW | 60 mW |
| 2450 | 4 mW | 7 mW | 15 mW | 30 mW | 52 mW |
| 3500 | 2 mW | 6 mW | 16 mW | 32 mW | 55 mW |
| 5800 | 1 mW | 6 mW | 15 mW | 27 mW | 41 mW |

| Frequency (MHz) | Exemption Limits (mW) | | | | |
|---|---|---|---|---|---|
| | At separation distance of 30 mm | At separation distance of 35 mm | At separation distance of 40 mm | At separation distance of 45 mm | At separation distance of ≥50 mm |
| ≤300 | 223 mW | 254 mW | 284 mW | 315 mW | 345 mW |
| 450 | 141 mW | 159 mW | 177 mW | 195 mW | 213 mW |
| 835 | 80 mW | 92 mW | 105 mW | 117 mW | 130 mW |
| 1900 | 99 mW | 153 mW | 225 mW | 316 mW | 431 mW |
| 2450 | 83 mW | 123 mW | 173 mW | 235 mW | 309 mW |
| 3500 | 86 mW | 124 mW | 170 mW | 225 mW | 290 mW |
| 5800 | 56 mW | 71 mW | 85 mW | 97 mW | 106 mW |

Output power level shall be the higher of the maximum conducted or equivalent isotropically radiated power (e.i.r.p.) source-based, time-averaged output power. For controlled use devices where the 8 W/kg for 1 gram of tissue applies, the exemption limits for routine evaluation in Table 1 are multiplied by a factor of 5. For limb-worn devices where the 10 gram value applies, the exemption limits for routine evaluation in Table 1 are multiplied by a factor of 2.5. If the operating frequency of the device is between two frequencies located in Table 1, linear interpolation shall be applied for the

applicable separation distance. For test separation distance less than 5 mm, the exemption limits for a separation distance of 5 mm can be applied to determine if a routine evaluation is required.
For medical implants devices, the exemption limit for routine evaluation is set at 1 mW. The output power of a medical implants device is defined as the higher of the conducted or e.i.r.p to determine whether the device is exempt from the SAR evaluation.

## 3.2. Result and Assessment

**Conducted Power Results**

| GFSK mode | | | |
|---|---|---|---|
| Channel | Channel 0 | Channel 39 | Channel 78 |
| Output Power (dBm) | 3.16 | 3.02 | 3.15 |

| π/4-DQPSK mode | | | |
|---|---|---|---|
| Channel | Channel 0 | Channel 39 | Channel 78 |
| Output Power (dBm) | 2.56 | 2.71 | 2.63 |

| 8- DPSK mode | | | |
|---|---|---|---|
| Channel | Channel 0 | Channel 39 | Channel 78 |
| Output Power (dBm) | 2.46 | 2.54 | 2.38 |

**Manufacturing tolerance**

| GFSK mode | | | |
|---|---|---|---|
| Channel | Channel 0 | Channel 39 | Channel 78 |
| Target (dBm) | 3 | 3 | 3 |
| Tolerance ±(dB) | 0.5 | 0.5 | 0.5 |

| π/4-DQPSK mode | | | |
|---|---|---|---|
| Channel | Channel 0 | Channel 39 | Channel 78 |
| Target (dBm) | 3 | 3 | 3 |
| Tolerance ±(dB) | 0.5 | 0.5 | 0.5 |

| 8- DPSK mode | | | |
|---|---|---|---|
| Channel | Channel 0 | Channel 39 | Channel 78 |
| Target (dBm) | 2.5 | 2.5 | 2.5 |
| Tolerance ±(dB) | 0.5 | 0.5 | 0.5 |

Maximum Antenna Gain: 2dBi

Refer to RSS-102 Issue 5 require, the conducted power is maximum compare with EIRP or ERP; the maximum output power (including power tolerance is 5.5dBm less than 4mW (6dBm);

So meet SAR Exemption limits for routine evaluation.