



## Shenzhen Huaxia Testing Technology Co., Ltd

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# RF Exposure Evaluation Report

**Report No. :** CQASZ20181200012E-03

**Applicant:** Shenzhen Hesibond IOT Technology Corp., Ltd.

**Address of Applicant:** Room 418, 4th Floor, Shenyi Industrial Building, Nanshan Avenue, Nanshan Street, Nanshan District, Shenzhen, China


**Manufacturer:** Shenzhen Hesibond IOT Technology Corp., Ltd.

**Address of Manufacturer:** Room 418, 4th Floor, Shenyi Industrial Building, Nanshan Avenue, Nanshan Street, Nanshan District, Shenzhen, China

**Equipment Under Test (EUT):**

**Product:** IOT Lock

**Model No.:** 2ASI7-LKF-05-BRW

**Brand Name:** 

**FCC ID:** 2ASI7-LKF-05-BRW

**Standards:** 47 CFR Part 1.1307  
47 CFR Part 1.1310  
KDB447498D01 General RF Exposure Guidance v06

**Date of Test:** 2018-12-06 to 2019-04-19

**Date of Issue:** 2019-04-19

**Test Result :** **PASS\***

**Tested By:**   
\_\_\_\_\_

(Tiny You)

**Reviewed By:**   
\_\_\_\_\_

(Aaron Ma)

**Approved By:**   
\_\_\_\_\_

( Jack Ai)



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

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.

## 1 Version

### Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20181200012E-03	Rev.01	Initial report	2019-04-19

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### 3 General Information

#### 3.1 Client Information

Applicant:	Shenzhen Hesibond IOT Technology Corp., Ltd.
Address of Applicant:	Room 418, 4th Floor, Shenyi Industrial Building, Nanshan Avenue, Nanshan Street, Nanshan District, Shenzhen, China
Manufacturer:	Shenzhen Hesibond IOT Technology Corp., Ltd.
Address of Manufacturer:	Room 418, 4th Floor, Shenyi Industrial Building, Nanshan Avenue, Nanshan Street, Nanshan District, Shenzhen, China

#### 3.2 General Description of EUT

Name:	IOT Lock
Model No.:	2ASI7-LKF-05-BRW
Trade Mark :	
Hardware Version:	V501
Software Version:	2.4G-MKZB3X-V1.1
Power Supply:	DC1.5 X 4AA

#### 3.3 General Description of 2.4G

Frequency Range:	2469 MHz
Modulation Type:	ASK
Number of Channels:	1 (declared by the client)
Test Software of EUT:	RF test (manufacturer declare )
Antenna Type:	Internal antenna
Antenna Gain:	0dBi

#### 3.4 General Description of NFC

Operation Frequency:	13.56MHz
Modulation Type:	ASK
Product Type:	<input type="checkbox"/> Mobile <input type="checkbox"/> Portable <input checked="" type="checkbox"/> Fix Location
Antenna Type:	PCB antenna
Antenna Gain:	0dBi

## 4 RF Exposure Evaluation

### 4.1 RF Exposure Compliance Requirement

#### 4.1.1 Standard Requirement

According to KDB447498D01 General RF Exposure Guidance v06

##### 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 Exclusion Threshold condition, listed below, is satisfied.

#### 4.1.2 Limits

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances  $\leq 50$  mm are determined by:

$$\left[ \frac{\text{max. power of channel, including tune-up tolerance, mW}}{\text{min. test separation distance, mm}} \right] \cdot \sqrt{f(\text{GHz})} \leq 3.0$$
 for 1-g SAR and  $\leq 7.5$  for 10-g extremity SAR, where

$f(\text{GHz})$  is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation<sup>17</sup>

The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is  $\leq 50$  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 is applied to determine SAR test exclusion

## 4.2 EUT RF Exposure Evaluation

### 1) For 2.4G

$$e_{irp} = p_t \times g_t = (E \times d)^2 / 30$$

where:

$p_t$  = transmitter output power in watts,

$g_t$  = numeric gain of the transmitting antenna (unitless),

$E$  = electric field strength in V/m,  $10^{((dB\mu V/m)/20)/10^6}$ ,

$d$  = measurement distance in meters (m)---3m,

$$\text{So } p_t = (E \times d)^2 / 30 / g_t$$

The worst case (refer to report CQASZ20181200012E-01) is below:

Antenna polarization: Horizontal		
Frequency (MHz)	Level (dBuV/m)	Polarization
2469	92.65	Peak
2469	87.03	Average

Antenna polarization: Vertical		
Frequency (MHz)	Level (dBuV/m)	Polarization
2469	95.61	Peak
2469	87.42	Average

For 2469MHz wireless:

Field strength = 95.61dB $\mu$ V/m @3m

Ant. gain 0dBi; so Ant numeric gain=1.0

So  $p_t = \{ [10^{(95.61/20)} / 10^6 \times 3]^2 / 30 / 1.0 \} \times 1000 \text{mW} = 1.092 \text{mW}$

So  $(1.092 \text{mW} / 5 \text{mm}) \times \sqrt{2.469 \text{GHz}} = 0.343$ ,

0.343 < 3.0 for 1-g SAR

So the SAR report is not required.

**2) For NFC**

$$e_{irp} = p_t \times g_t = (E \times d)^2 / 30$$

where:

$p_t$  = transmitter output power in watts,

$g_t$  = numeric gain of the transmitting antenna (unitless),

$E$  = electric field strength in V/m,  $10^{((dB\mu V/m)/20)/10^6}$ ,

$d$  = measurement distance in meters (m)---3m,

$$\text{So } p_t = (E \times d)^2 / 30 / g_t$$

The worst case (refer to report CQASZ20181200012E-02) is below:

Frequency (MHz)	Level (dBuV/m)	Polarization
13.56	52.40	Peak

For 13.56MHz wireless:

Field strength = 52.4dBuV/m @3m

Ant. gain 0dBi; so Ant numeric gain=1.0

$$\text{So } p_t = \{ [10^{(52.4/20)/10^6} \times 3]^2 / 30 / 1.0 \} \times 1000 \text{mW} = 0.0001 \text{mW}$$

$$\text{So } (0.0001 \text{mW} / 5 \text{mm}) \times \sqrt{0.01356 \text{GHz}} = 0.0000012,$$

0.0000012 < 3.0 for 1-g SAR

So the SAR report is not required.

**3) For 2.4G + NFC**

The simultaneously transmission mode.

$$\text{SUM} = 2.4\text{G} + \text{NFC} = 0.343 + 0.0000012 = 0.3430012$$

0.3430012 < 3.0 for 1-g SAR

So the SAR report is not required.