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# RF Exposure Evaluation Report

**Report No. :** CQASZ20180800042E-02

**Applicant:** Seal Electronics Asia Limited

**Address of Applicant:** Room B, 14/F Wah Hen Commercial Centre, 383 Hennessy Road, Wan Chai, Hong Kong

**Manufacturer:** Seal Electronics Asia Limited

**Address of Manufacturer:** Room B, 14/F Wah Hen Commercial Centre, 383 Hennessy Road, Wan Chai, Hong Kong

### Equipment Under Test (EUT):

**Product:** Wireless Electronic Pet Fence System

**Model No.:** KD661C, SDF-661

**Test Model No.:** KD661C

**Brand Name:** N/A

**FCC ID:** 2AA4I-1242018

**Standards:** 47 CFR Part 1.1307

47 CFR Part 2.1093

KDB447498D01 General RF Exposure Guidance v06

**Date of Test:** 2018-08-15 to 2018-08-24

**Date of Issue:** 2018-08-24

**Test Result :** PASS\*

**Tested By:**

Tiny You

( Tiny You )

Aaron Ma

(Aaron Ma)

Jack Ai

**Reviewed By:**



**Approved By:**

\* 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
CQASZ20180800042E-02	Rev.01	Initial report	2018-08-24

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### 3 General Information

#### 3.1 Client Information

Applicant:	Seal Electronics Asia Limited
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Manufacturer:	Seal Electronics Asia Limited
Address of Manufacturer:	Room B, 14/F Wah Hen Commercial Centre, 383 Hennessy Road, Wan Chai, Hong Kong

#### 3.2 General Description of EUT

Product Name:	Wireless Electronic Pet Fence System
Model No.:	KD661C, SDF-661
Test Model No.:	KD661C
Trade Mark:	N/A
Hardware Version:	V1.0
Software Version:	V1.0
Sample Type:	Portable production
Operation Frequency:	428.5-430.5MHZ
Channel Numbers:	3
Modulation Type:	GFSK
Antenna Type:	integral antenna
Antenna Gain:	0dBi
Power Supply:	Adapter: Input: 100~240V 0.3A 50-60Hz Output: DC 5V 1A Li-ion battery, DC3.7V 2500mAh

Note:

All model: KD661C, SDF-661

Only the model KD661C was tested, since the electrical circuit design, layout, components used and internal wiring were identical for the above models, with difference being color of appearance and model name.

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	428.5MHz	2	429.5MHz	3	430.5MHz		

Note:

In section 15.31(m), regards to the operating frequency less than over 10 MHz, the lowest frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The lowest channel (CH1)	428.5MHz
The highest channel (CH3)	430.5MHz

## 4 SAR 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:

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

$f(\text{GHz})$  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

#### 4.1.3 EUT RF Exposure

$$eirp = pt \times gt = (E \times d)^2 / 30$$

where:

pt = transmitter output power in watts,

gt = 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,

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

The worst case (refer to report CQASZ20180800042E-01) is below:

Test frequency 428.5MHz

Antenna polarization: Horizontal		
Frequency (MHz)	Level (dBuV/m)	Polarization
428.5	86.16	Peak
428.5	74.95	Average

Antenna polarization: Vertical		
Frequency (MHz)	Level (dBuV/m)	Polarization
428.5	72.43	Peak
428.5	61.22	Average

Test frequency 430.5MHz

Antenna polarization: Horizontal		
Frequency (MHz)	Level (dBuV/m)	Polarization
430.5	78.31	Peak
430.5	68.17	Average

Antenna polarization: Vertical		
Frequency (MHz)	Level (dBuV/m)	Polarization
430.5	69.24	Peak
430.5	59.1	Average

worst case For 428.5MHz wireless:

Field strength = 86.16dB $\mu$ V/m @3m

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

$$\text{So } pt = [10^{(86.16/20)/10^6} / 10^6 \times 3]^2 / 30 / 1.0 \times 1000 \text{mW} = 0.124 \text{mW}$$

$$\text{So } (0.124 \text{mW} / 5 \text{mm}) \times \sqrt{0.4285 \text{GHz}} = 0.016$$

0.016 < 3.0 for 1-g SAR

So the SAR report is not required.