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# RF Exposure Evaluation Report

**Report No.:** CQASZ202100500723E-02  
**Applicant:** Professional Security Corporation DBA Personal Safety Corporation  
**Address of Applicant:** 1655 Progress Drive, Hiawatha, Iowa 52233, USA  
**Equipment Under Test (EUT):**  
**EUT Name:** Wireless Alarm Transmitter  
**Model No.:** WAT-1R  
**Brand Name:** Secure®  
**FCC ID:** 2ADJMWAT-1R  
**Standards:** 47 CFR Part 1.1307  
47 CFR Part 1.1310  
KDB447498D01 General RF Exposure Guidance v06  
**Date of Receipt:** 2021-05-28  
**Date of Test:** 2021-05-28 to 2021-06-24  
**Date of Issue:** 2021-06-24  
**Test Result:** **PASS\***

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

**Tested By:**

*Lewis Zhou*

(Lewis Zhou)

**Reviewed By:**

*Jun Li*

(Jun Li)

**Approved By:**

*Sheek Luo*

(Sheek Luo)



## 1 Version

### Revision History Of Report

| Report No.            | Version | Description    | Issue Date |
|-----------------------|---------|----------------|------------|
| CQASZ202100500723E-02 | Rev.01  | Initial report | 2021-06-24 |

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### 3 General Information

#### 3.1 Client Information

|                          |                                                                   |
|--------------------------|-------------------------------------------------------------------|
| Applicant:               | Professional Security Corporation DBA Personal Safety Corporation |
| Address of Applicant:    | 1655 Progress Drive, Hiawatha, Iowa 52233, USA                    |
| Manufacturer:            | Professional Security Corporation DBA Personal Safety Corporation |
| Address of Manufacturer: | 1655 Progress Drive, Hiawatha, Iowa 52233, USA                    |

#### 3.2 General Description of EUT

|                       |                                                                                                                    |
|-----------------------|--------------------------------------------------------------------------------------------------------------------|
| Product Name:         | Wireless Alarm Transmitter                                                                                         |
| Model No.:            | WAT-1R                                                                                                             |
| Trade Mark:           | Secure®                                                                                                            |
| Hardware Version:     | V1.0                                                                                                               |
| Software Version:     | V1.0                                                                                                               |
| Frequency Range:      | 2432MHz ~ 2454MHz                                                                                                  |
| Modulation Type:      | GFSK                                                                                                               |
| Number of Channels:   | 3                                                                                                                  |
| Sample Type:          | <input type="checkbox"/> Mobile <input checked="" type="checkbox"/> Portable <input type="checkbox"/> Fix Location |
| Test Software of EUT: | RF test                                                                                                            |
| Antenna Type:         | PCB antenna                                                                                                        |
| Antenna Gain:         | 1.6 dBi                                                                                                            |
| Power Supply:         | Because this test EUT is powered by 2*AAA size batteries                                                           |

## 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:

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

$f(\text{GHz})$  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

## 4.2 EUT RF Exposure Evaluation

### 1) For 2.4G

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

where:

$p_t$  = transmitter output power in watts,

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

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

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

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

The worst case (refer to report CQASZ202100500723E-01) is below:

| Antenna polarization: Horizontal |                |              |
|----------------------------------|----------------|--------------|
| Frequency (MHz)                  | Level (dBuV/m) | Polarization |
| 2454                             | 89.61          | Peak         |
| 2454                             | 86.86          | Average      |

For 2460MHz wireless:

Field strength = 89.61dBuV/m @3m

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

$$\text{So } p_t = \{ [10^{(89.61/20)} / 10^6 \times 3]^2 / 30 / 1.0 \} \times 1000 \text{mW} = 0.274 \text{mW}$$

$$\text{So } (0.274 \text{mW} / 5 \text{mm}) \times \sqrt{2.460 \text{GHz}} = 0.086,$$

$$0.086 < 3.0 \text{ for 1-g SAR}$$

So the SAR report is not required.