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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:	☐ Mobile ☒ Portable ☐ 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 ≤ 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 calculation¹⁷

The result is rounded to one decimal place for comparison

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 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 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 = 89.61dB μ V/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.