



Shenzhen Huaxia Testing Technology Co., Ltd

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

Telephone: +86-755-26648640

Fax: +86-755-26648637

Website: www.cqa-cert.com

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RF Exposure Evaluation Report

Report No. : CQASZ20190800044EX-02
Applicant: Black Widow Security System LLC.
Address of Applicant: 507 Verona Way Chapin SC 29036.
Manufacturer: GD TECHWAY INTERNATIONAL CO., LTD
Address of Manufacturer: 5th floor, A1 Building, Baicai Industrial Park, No.19 Tian Bao Road, YingRenShi, Shiyan Town, Shenzhen, China
Equipment Under Test (EUT):
Product: ALARM REMOTE CONTROL
Model No.: GD-F02D
Brand Name: N/A
FCC ID: 2AUEB-GDF02
Standards: 47 CFR Part 1.1307
47 CFR Part 2.1093
KDB447498D01 General RF Exposure Guidance v06
Date of Test: Aug. 19, 2019 to Aug. 28, 2019
Date of Issue: Aug. 28, 2019
Test Result : PASS*

Tested By:

Martin Lee

(Martin Lee)

Reviewed By:

Aaron Ma

(Aaron Ma)

Approved By:

Jack Ai

(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
CQASZ20190800044EX-02	Rev.01	Initial report	Aug. 28, 2019

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3 General Information

3.1 Client Information

Applicant:	Black Widow Security System LLC.
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3.2 General Description of EUT

Product Name:	ALARM REMOTE CONTROL
Test Model No.:	GD-F02D
Trade Mark:	N/A
Hardware Version:	V1.0
Software Version:	N/A
Sample Type:	☐ Mobile ☒ Portable ☐ Fix Location
Power Supply:	DC12.0V from battery

3.3 General Description of wireless

Operation Frequency:	433.92MHz
Channel Numbers:	1
Modulation Type:	GFSK
Antenna Type:	PCB antenna
Antenna Gain:	-2.0dBi

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 ≤ 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

4.1.3 EUT RF Exposure

For 433.92MHz:

The worst case (refer to report CQASZ20190800044EX-01) is below:

Antenna polarization: Horizontal		
Frequency (MHz)	Level (dBuV/m)	Frequency (MHz)
433.92	86.77	Peak
433.92	75.27	Average

Antenna polarization: Vertical		
Frequency (MHz)	Level (dBuV/m)	Frequency (MHz)
433.92	88.13	Peak
433.92	76.63	Average

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

where:

p_t = transmitter output power in watts,

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

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

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

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

For 433.92MHz wireless:

Field strength = 88.13dBuV/m @3m

Ant. gain -2.0dBi; so Ant numeric gain=0.631

$$\text{So } p_t = \{ [10^{(88.13/20)} / 10^6 \times 3]^2 / 30 / 0.631 \} \times 1000 \text{mW} = 0.309$$

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 1 cm (mW/cm ²)	Limit	Result
0.309	-2.0	0.0155	0.289	PASS

Note: 1) $P_d = (P_{out} \times G) / (4 \times \pi \times R^2) = (0.309 \times 0.631) / (4 \times 3.1416 \times 1^2) = 0.0155$

2) Limit = 433.92/1500 = 0.289