

FCC RF Exposure Exemption report

for

Smart Home Alarm System

Model No.: HSGW-G8

FCC ID: GX9HSGWF1919

of

Applicant: CLIMAX TECHNOLOGY CO., LTD.

**Address: No. 258, Sinhu 2nd Rd., Neihu District,
Taipei City 114, Taiwan (R.O.C.)**

Tested and Prepared

by

Worldwide Testing Services (Taiwan) Co., Ltd.

FCC Registration No.: TW1477, TW1072

Industry Canada filed test laboratory Reg. No.: 20037, 5107A



Report No.: W6R22309-22979-EE

6F, NO. 58, LANE 188, RUEY-KUANG RD., NEIHU TAIPEI 114, TAIWAN, R.O.C.
TEL: 886-2-66068877 FAX: 886-2-66068879 E-mail: wts@wts-lab.com



Registration number: W6R22309-22979-EE
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1 General Information

1.1 Notes

The purpose of conformity testing is to increase the probability of adherence to the essential requirements or conformity specifications, as appropriate.

The complexity of the technical specifications, however, means that full and thorough testing is impractical for both technical and economic reasons.

Furthermore, there is no guarantee that a test sample which has passed all the relevant tests conforms to a specification.

Neither is there any guarantee that such a test sample will interwork with other genuinely open systems.

The existence of the tests nevertheless provides the confidence that the test sample possesses the qualities as maintained and that its performance generally conforms to representative cases of communications equipment.

Laboratory disclaimer-

1. The test results of this test report relate exclusively to the item tested as specified in 1.5.
2. The test report may only be reproduced or published in full.
3. Reproduction or publication of extracts from the report requires the prior written approval of the Worldwide Testing Services(Taiwan) Co., Ltd.
4. Antenna gain is provided by applicant and laboratory issue relevant data and results.

Tester:

October 30, 2023

Sora Kuo

Date

WTS-Lab.

Name

Signature

Technical responsibility for area of testing:

October 30, 2023

Kevin Wang

Date

WTS

Name

Signature



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1.2 Testing laboratory

1.2.1 Location

10m OATS

No.5-1, Lishui, Shuang Sing Village, Wanli Dist.,
New Taipei City 207, Taiwan (R.O.C.)

3 meter semi-anechoic chamber

No.35, Aly. 21, Ln. 228, Ankang Rd., Neihu Dist.,
Taipei City 114, Taiwan (R.O.C.)

Tel: 886-2-6613-0228

Worldwide Testing Services (Taiwan) Co., Ltd.

6F., No. 58, Ln. 188, Ruiguang Rd., Neihu Dist.,
Taipei City 114, Taiwan (R.O.C.)

Tel: 886-2-6606-8877

1.2.2 Details of accreditation status

Accredited testing laboratory

FCC filed test laboratory Reg. No.: TW1477, TW1072

Industry Canada filed test laboratory Reg. No.: 20037, 5107A

Test location, where different from Worldwide Testing Services (Taiwan) Co., Ltd. :

Name: ./.

Accredited no.: ./.

Street: ./.

Town: ./.

Country: ./.

1.3 Application details

Approval holder

Name: CLIMAX TECHNOLOGY CO., LTD.

Street: No. 258, Sinhu 2nd Rd., Neihu District,

Town: Taipei City 114,

Country: Taiwan (R.O.C.)

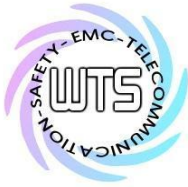
Manufacturer: (if applicable)

Name: ./.

Street: ./.

Town: ./.

Country: ./.



Registration number: W6R22309-22979-EE
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Date of receipt of test item: September 22, 2023

Date of test: from September 25, 2023 to October 30, 2023

1.4 General information of Test item

Type of test item: Smart Home Alarm System
Model no.: HSGW-G8
Multi-listing model no.: ./.
Brand name: ./.
Power supply: Adapter (I/P: 100-240V~0.4A 50/60Hz
O/P: 12.0=1.0A 12.0W)
Battery 7.2Vd.c., 1600mAh

Type of antenna: Monopole antenna

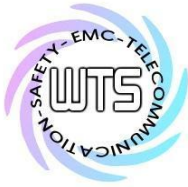
Antenna gain: 1.19 dBi

Technical data:

Band	Channel	Power (dBm)
919M	918.0375 MHz	10.63
	921.98 MHz	9.06
	924.48 MHz	9.17

Mode	Channel/Frequency (MHz)	Power (dBm)
GSM	Ch 128 : 824.2 MHz	31.38
	Ch 188 : 836.2 MHz	31.45
	Ch 251 : 848.8 MHz	31.57

Mode	Channel/Frequency (MHz)	Power (dBm)
WCDMA	Ch 9262 : 1852.4 MHz	22.47
	Ch 9400 : 1880 MHz	22.54
	Ch 9538 : 1907.6 MHz	22.48



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Mode	Channel/Frequency (MHz)	Power (dBm)
LTE	Ch 27225 : 704.5 MHz	23.47
	Ch 27375 : 719.5 MHz	23.34
	Ch 27645 : 746.5 MHz	23.47
	Ch 27235 : 705.05 MHz	23.46
	Ch 27385 : 720.5 MHz	23.29
	Ch 27635 : 745.5 MHz	23.41
	Ch 27260 : 708 MHz	23.54
	Ch 27410 : 723 MHz	23.42
	Ch 27610 : 743 MHz	23.47
	Ch 27285 : 710.5 MHz	23.26
	Ch 27435 : 725.5 MHz	23.44
	Ch 27585 : 740.5 MHz	23.41
	Ch 27310 : 713 MHz	22.91
	Ch 27460 : 728 MHz	23.25
	Ch 27560 : 738 MHz	22.97

Operation modes: 919MHz: Half-duplex
GSM & WCDMA & LTE: Duplex

Modulation type: 919MHz: FSK
GSM: GMSK
WCDMA: BPSK
LTE: QPSK/16QAM

Sample no.: #01

Special statement: 1. This case is class II change.
2. The differences are the PCB layout, appearance, and module of brand name.

Classification:

Fixed Device	<input checked="" type="checkbox"/>
Mobile Device (Human Body distance > 20cm)	<input type="checkbox"/>
Portable Device (Human Body distance < 20cm)	<input type="checkbox"/>

1.5 Test standards

47 CFR PART 15 SUBPART C § 15.247 (2021-10)
47CFR Part 22 (2021-10), Part 24 (2021-10) and Part 27 (2021-10)



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2 Test configuration

2.1 Test environment

Relative humidity content: 20 ... 75 %

Air pressure: 86 ... 103 kPa

Extreme conditions parameters: ./.

2.2 Measurement uncertainty

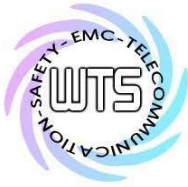
Test item Name	Uncertainty
Estimation Result of Uncertainty of Conducted Output Power Measurement (Peak Output Power (transmitter))	Expanded Uncertainty : 1.48 dB

The decision rule is: Measurement uncertainty is not included in the calculation of test results.

2.3 Test Equipment List

RF Conducted

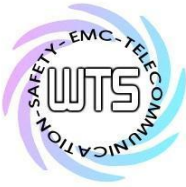
No.	Test equipment	Type	Serial No.	Manufacturer	Cal. Date	Next Cal. Date
ETSTW-CE 009	TEMP.&HUMIDITY CHAMBER	GTH-225-40-1P-U	MAA0305-009	GIANT FORCE	2023/7/24	2024/7/23
ETSTW-RE 050	Attenuator 10dB	50HF-010-1	None	JFW	2023/2/17	2024/2/16
ETSTW-RE 051	Attenuator 6dB	50HF-006-1	None	JFW	2023/2/17	2024/2/16
ETSTW-RE 053	Attenuator 3dB	50HF-003-1	None	JFW	2023/2/17	2024/2/16
ETSTW-RE 055	SPECTRUM ANALYZER	FSU 26	200074	R&S	2023/3/22	2024/3/21
ETSTW-RE 060	Attenuator 30dB	5015-30	F651012z-01	ATM	2023/2/17	2024/2/16
ETSTW-RE 099	DC Block	50DB-007-1	None	JFW	2023/2/17	2024/2/16
ETSTW-RE 112	AC POWER SOURCE	TFC-1005	T-0A023536	T-Power	Function test	
ETSTW-RE 127	RF Switch Box	RFS-01	None	WTS	2023/2/17	2024/2/16
ETSTW-RE 153	Signal Analyzer	FSV40	101929	R&S	2023/9/20	2024/9/19
ETSTW-GSM 023	Power Divider	4901.19.A	None	SUHNER	2023/8/28	2024/8/27
ETSTW-Cable 027	Microwave Cable	SUCOFLEX 104	279083	HUBER+SUHNER	2023/4/27	2024/4/26
ETSTW-Cable 030	Microwave Cable	SUCOFLEX 104 (S_Cable 9)	279067	HUBER+SUHNER	2023/02/17	2024/2/16
ETSTW-Cable 045	Microwave Cable	SUCOFLEX 104	325536	HUBER+SUHNER	2023/10/20	2024/10/19
ETSTW-Cable 058	Microwave Cable	SUCOFLEX 104	none	HUBER+SUHNER	2023/5/26	2024/5/25
WTSTW-SW 008	Signal studio	Agilent	None	AUDIX	Version 2.0.0.1	



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No.	Test equipment	Type	Serial No.	Manufacturer	Cal. Date	Next Cal. Date
ETSTW-GSM 002	Universal Radio Communication Tester	CMU 200	109439	R&S	2023/3/22	2024/3/21
ETSTW-GSM 003	Radio Communication Analyzer	MT8820C	6201342073	Anritsu	2023/5/10	2024/5/9
ETSTW-GSM 004	Wideband Radio Communication Tester	CMW500	128092	R&S	2023/5/10	2024/5/9
ETSTW-GSM 019	Band Reject Filter	WRCTF824/849-822/851-40 /12+9SS	3	WI	2023/1/4	2024/1/3
ETSTW-GSM 020	Band Reject Filter	WRCD1747/1748-1743/1752-32/5SS	1	WI	2023/1/4	2024/1/3
ETSTW-GSM 021	Band Reject Filter	WRCD1879.5/1880.5-1875.5/1884.5-32/5SS	3	WI	2023/1/4	2024/1/3
ETSTW-GSM 022	Band Reject Filter	WRCT901.9/903.1-904.25-50/8SS	1	WI	2023/1/4	2024/1/3
ETSTW-GSM 024	Radio Communication Analyzer	MT8821C	None	Anritsu	2023/4/24	2024/4/23
ETSTW-GSM 025	Band Reject Filter	BRM19835	001	Micro-Tronics	2023/8/4	2024/8/3



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3 Equivalent Isotropic Radiated Power (EIRP)

3.1 Exemption Limits for Routine Evaluation

according to 47 CFR FCC Part 2 Subpart J, section 2.1091

FCC OET Bulletin 65 Edition 97.01 determines the equations for predicting RF fields and applicable limits.

The prediction for power density in the far-field but will over-predict power density in the near field, where it could be used for walking a “worst case” or conservative prediction.

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 20 cm normally can be maintained between the user and the device.

MPE Calculation Method

(A) Limits for Occupational/Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f ²)*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

(B) Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f ²)*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz

*Plane-wave equivalent power density

E = Electric field (V/m) P = output power (W) G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2} \text{ mW/cm}^2.$$



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Established separation distance is 20 cm.

919MHz

Operating frequency band: 918.0375-924.48MHz

GSM 850

Operating frequency band: 824.2-848.8MHz

WCDMA Band 2

Operating frequency band: 1852.4-1907.6MHz

LTE Band 28

Operating frequency band: 704.5-746.5 MHz

919MHz

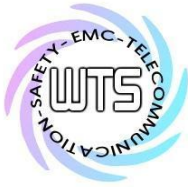
Mode	Channel/Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	Power density (mW/cm ²)	Limit (mW/cm ²)	Ratio
919	918.0375 MHz	10.63	1.19	0.003	0.6120	0.0049
	921.98 MHz	9.06	1.19	--	--	--
	924.48 MHz	9.17	1.19	--	--	--

GSM 850

Mode	Channel/Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	Power density (mW/cm ²)	Limit (mW/cm ²)	Ratio
GSM	Ch 128 : 824.2 MHz	31.38	1.45	--	--	--
	Ch 188 : 836.2 MHz	31.45	1.45	--	--	--
	Ch 251 : 848.8 MHz	31.57	1.45	0.3988	0.5658	0.7048

WCDMA Band 2

Mode	Channel/Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	Power density (mW/cm ²)	Limit (mW/cm ²)	Ratio
WCDMA	Ch 9262 : 1852.4 MHz	22.47	-0.27	--	--	--
	Ch 9400 : 1880 MHz	22.54	-0.27	0.0336	1	0.0336
	Ch 9538 : 1907.6 MHz	22.48	-0.27	--	--	--



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LTE Band 28

Mode	Channel/Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	Power density (mW/cm ²)	Limit (mW/cm ²)	Ratio
LTE	Ch 27225 : 704.5 MHz	23.47	0.65	--	--	--
	Ch 27375 : 719.5 MHz	23.34	0.65	--	--	--
	Ch 27645 : 746.5 MHz	23.47	0.65	--	--	--
	Ch 27235 : 705.05 MHz	23.46	0.65	--	--	--
	Ch 27385 : 720.5 MHz	23.29	0.65	--	--	--
	Ch 27635 : 745.5 MHz	23.41	0.65	--	--	--
	Ch 27260 : 708 MHz	23.54	0.65	0.0522	0.472	0.1106
	Ch 27410 : 723 MHz	23.42	0.65	--	--	--
	Ch 27610 : 743 MHz	23.47	0.65	--	--	--
	Ch 27285 : 710.5 MHz	23.26	0.65	--	--	--
	Ch 27435 : 725.5 MHz	23.44	0.65	--	--	--
	Ch 27585 : 740.5 MHz	23.41	0.65	--	--	--
	Ch 27310 : 713 MHz	22.91	0.65	--	--	--
	Ch 27460 : 728 MHz	23.25	0.65	--	--	--
	Ch 27560 : 738 MHz	22.97	0.65	--	--	--

From the peak EUT RF output power, the minimum mobile separation distance, $d = 20$ cm, as well as the gain of the used antenna, the RF power density can be obtained.

Simultaneous evaluation-

$$0.7048 \text{ (GSM 850)} + 0.0049 \text{ (919MHz)} = 0.7097 < 1$$