

Test report No:  
4892ERM.007A1

## Assessment report

### RF EXPOSURE REPORT ACCORDING TO FCC 47 CFR Part 2.1091; FCC 47 CFR Part 1.1307 FCC 47 CFR Part 1.1310

(*) Identification of item tested	Wireless Alarm System with Integrated Home Automation
(*) Trademark	Qolsys
(*) Model and /or type reference tested	IQPanel5
Other identification of the product	FCC ID: 2AAJXQSIQP5 IC ID: 11205A-QSIQP5
(*) Features	LTE, BLE, Wi-Fi, Z-Wave, PowerG
Manufacturer	Qolsys Inc. 1919 S Bascom Ave., Suite 600, Campbell, CA 95008, USA
Test method requested, standard	FCC 47 CFR Part 2.1091 Radiofrequency radiation exposure evaluation: mobile devices. FCC 47 CFR Part 1.1307: Actions that may have a significant environmental effect, for which Environmental Assessments (EAs) must be prepared. FCC 47 CFR Part 1.1310: Radiofrequency radiation exposure limits.
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Domingo Galvez EMC&RF Lab Manager
Date of issue	04-03-2025
Report template No	FERMUSA_199 (*) "Data provided by the client"

# Index

Competences and guarantees .....3

General conditions.....3

Data provided by the client .....3

Document history .....3

Appendix A: FCC RF Exposure Evaluation .....5

General description of the device under evaluation .....6

Evaluation Results .....8

Appendix B: FCC RF Exposure information .....9

RF Exposure determination of exemption .....10

RF Exposure evaluation .....12

## Competences and guarantees

---

In order to assure the traceability to other national and international laboratories, DEKRA Certification Inc. has a calibration and maintenance program for its measurement equipment.

DEKRA Certification Inc. guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Certification Inc. at the time of performance of the test.

DEKRA Certification Inc. is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Assessment Report apply only to the particular item under test established in this document.

IMPORTANT: No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA Certification Inc.

## General conditions

---

1. This report is only referred to the item that has undergone the assessment.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA Certification Inc..
4. This assessment report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Certification Inc. and the Accreditation Bodies.

## Data provided by the client

---

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested").
2. The sample consists of a Wireless Alarm System with Integrated Home Automation. IQPanel5 is a wireless alarm system that monitors protected premises and sends alarms via LTE cellular network or Wi-Fi to a compatible alarm receiver at the monitoring station. It receives alarms from PowerG fire/intrusion initiating devices, it has integral siren and touch screen display. It also contains Z-Wave interface for controlling home automation devices. It is powered via an external power adapter rated 12Vdc/1A and it has an internal back-up battery for 24h standby.

DEKRA declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

## Identification of the client

---

QOLSYS INC.  
1919 S Bascom Ave., Suite 600, Campbell  
CA 95008, USA

## Document history

Report number	Date	Description
4892ERM.007	01-27-2025	First release.
4892ERM.007A1	04-03-2025	Second release. The Z-Wave (normal) and Z-Wave (long range) test results has been added and updated. This modified report replaces and cancels the report 4892ERM.007.

## Appendix A: FCC RF Exposure Evaluation

## General description of the device under evaluation

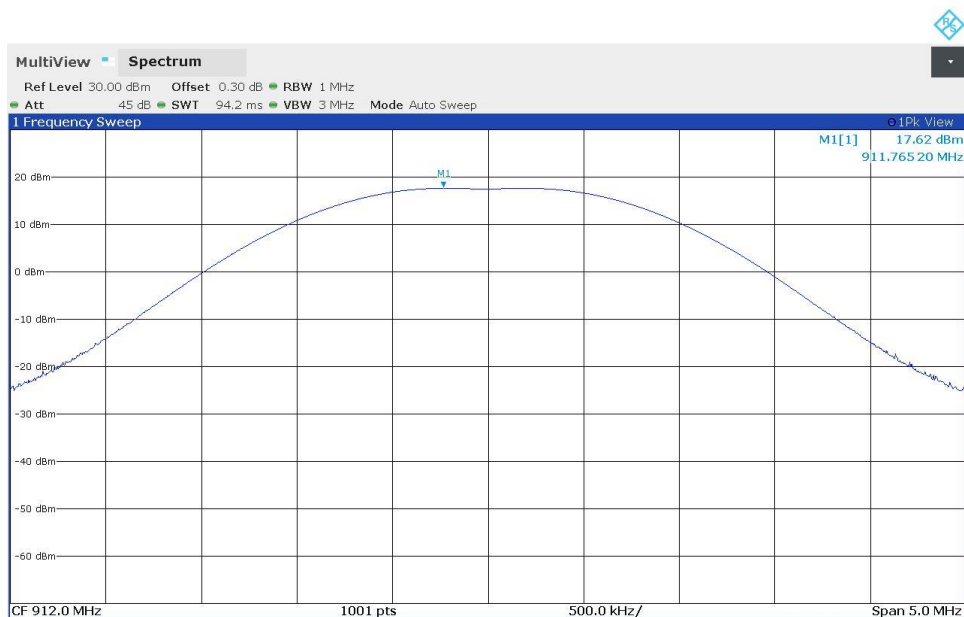
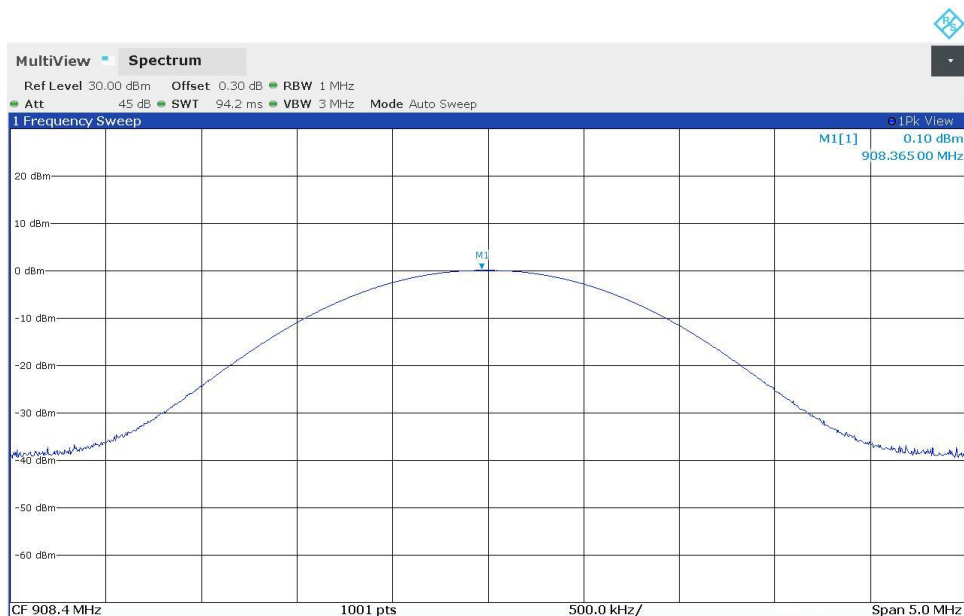
The device under evaluation consists of a Wireless Alarm System with Integrated Home Automation.

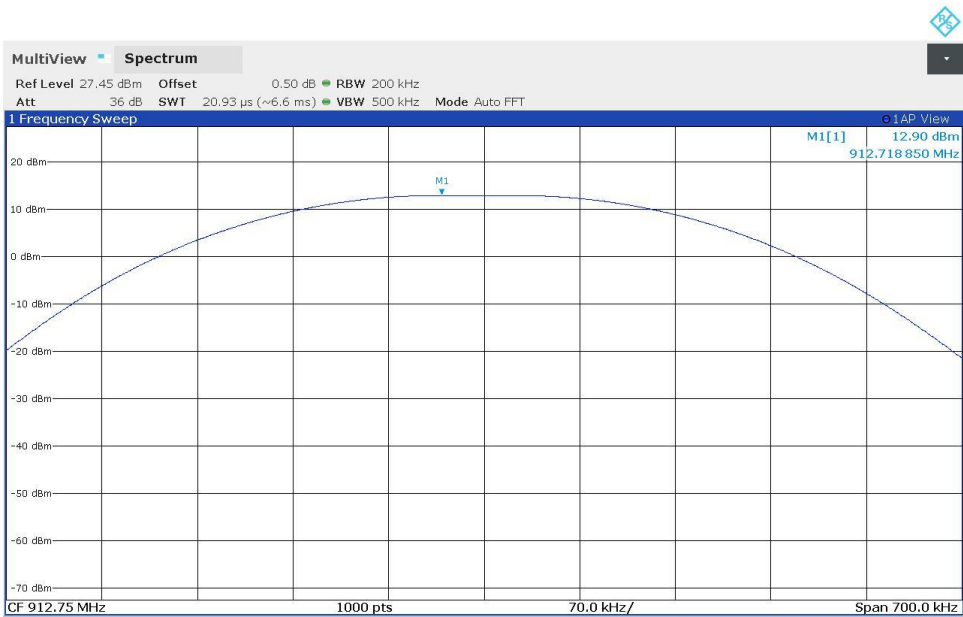
According to the manufacturer, during its normal use, the separation distance between the radiating structures of the device and nearby users will be greater than 20 cm. In order to perform the assessment, a conservative evaluation distance of 20 cm has been used.

The equipment specifications have been declared by the manufacturer for each supported technology are shown in Table 1.

The values corresponding to LTE, BTLE, Wi-Fi 2.4GHz, and Wi-Fi 5GHz technologies are mentioned in FCC identifier XMR2022SC200ENA.

Maximum Conducted Power measurement results: 0.10 dBm for Z-Wave (normal), 17.62 dBm for Z-Wave (long range) and 12.90 dBm for PowerG.





Technology / Mode	Band	Frequency (MHz)	Maximum Conducted Output Power (dBm)	Antenna peak gain (dBi)	Maximum E.R.P. (dBm)	Maximum E.R.P. (mW)
LTE	2	1850 - 1910	23.24	3.00	24.09	256.45
LTE	4	1710 - 1755	23.52	4.10	25.47	352.37
LTE	5	824 - 849	23.59	1.70	23.14	206.06
LTE	7	2500 - 2570	23.18	0.40	21.43	139.00
LTE	12	699 - 716	23.43	-0.90	20.38	109.14
LTE	13	777 - 787	23.22	1.50	22.57	180.72
LTE	14	788 - 798	23.37	2.40	23.62	230.14
LTE	25	1850 - 1915	23.85	3.00	24.70	295.12
LTE	26	814 - 849	23.71	1.70	23.26	211.84
LTE	66	1710 - 1780	23.32	4.10	25.27	336.51
LTE	71	663 - 698	23.50	-1.10	20.25	105.93
802.11b/g/n	2.4 GHz	2412 - 2484	23.38	3.00	24.23	264.85
802.11a/n/ac	5 GHz	5150 - 5850	16.36	4.00	18.21	66.22
BTLE	2.4 GHz	2400 - 2483,5	1.23	3.00	2.08	1.61
PowerG	ISM	912.75 - 919.107	12.90	0.41	11.16	13.06
Z-Wave (normal)	ISM	908.4 – 920	0.10	-0.66	-2.71	0.54
Z-Wave (long range)	ISM	908.4 – 920	17.62	-0.35	15.12	32.51

Table 1: Equipment specifications

## Evaluation Results

### RF Exposure Exemption evaluation:

Technology / Mode	Band	Frequency (MHz)	Distance (cm)	Maximum Conducted Power (mW)	Maximum E.R.P. (mW)	§1.1307(b)(3).i.(C) Exposure Limit (mW)	Verdict
LTE	2	1850 - 1910	20.00	-	256.45	3060.00	Pass
LTE	4	1710 - 1755	20.00	-	352.37	3060.00	Pass
LTE	5	824 - 849	20.00	228.56	-	1731.96	Pass
LTE	7	2500 - 2570	20.00	207.97	-	3060.00	Pass
LTE	12	699 - 716	20.00	220.29	-	1460.64	Pass
LTE	13	777 - 787	20.00	209.89	-	1605.48	Pass
LTE	14	788 - 798	20.00	-	230.14	1627.92	Pass
LTE	25	1850 - 1915	20.00	-	295.12	3060.00	Pass
LTE	26	814 - 849	20.00	234.96	-	1731.96	Pass
LTE	66	1710 - 1780	20.00	-	336.51	3060.00	Pass
LTE	71	663 - 698	20.00	223.87	-	1423.92	Pass
802.11b/g/n	2.4 GHz	2412 - 2484	20.00	-	264.85	3060.00	Pass
802.11a/n/ac	5 GHz	5150 - 5850	20.00	-	66.22	3060.00	Pass
BTLE	2.4 GHz	2400 - 2483,5	20.00	-	1.61	3060.00	Pass
PowerG	ISM	912.75 - 919.107	20.00	19.50	-	1874.98	Pass
Z-Wave (normal)	ISM	908.4 – 920	20.00	1.02	-	1876.80	Pass
Z-Wave (long range)	ISM	908.4 – 920	20.00	57.81	-	1876.80	Pass

**Table 2:** FCC Exemption Evaluation Results

The computed value(s) are below the limit(s), so these modes meet the requirements stated in FCC 47 CFR Part 1.1307.

### Simultaneous Transmission assessment:

The device under evaluation is able to transmit simultaneously in the following scenarios:

- LTE + BLE 2.4GHz + Z-Wave + PowerG
- LTE + 802.11b/g/n 2.4GHz + Z-Wave + PowerG
- LTE + 802.11a/n/ac 5GHz + Z-Wave + PowerG

Simultaneous technologies and modes	Result ( $\sum$ of Pout/Pmax ratios)	Verdict ( $\sum \leq 1$ )
LTE 14 + BTLE 2.4 GHz + PowerG ISM + Z-Wave (normal) ISM + Z-Wave (Long Range) ISM	0.66	Pass
LTE 14 + 802.11b/g/n 2.4 GHz + PowerG ISM + Z-Wave (normal) ISM + Z-Wave (Long Range) ISM	0.29	Pass
LTE 14 + 802.11a/n/ac 5 GHz + PowerG ISM + Z-Wave (normal) ISM + Z-Wave (Long Range) ISM	0.75	Pass

**Table 3:** Simultaneous Transmission Assessment



## Appendix B: FCC RF Exposure information

## RF Exposure determination of exemption

According to FCC 47 CFR §1.1307 (b)(3) Determination of exemption:

(i) For single RF sources (i.e., any single fixed RF source, mobile device, or portable device, as defined in paragraph (b)(2), a single RF source is exempt if:

(A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(ii)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(ii)(A);

(B) Or the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold P<sub>th</sub> (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). P<sub>th</sub> is given by:

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left( \frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

$d$  = the separation distance (cm);

(C) Or using Table 1 and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least  $\lambda/2\pi$ , where  $\lambda$  is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of  $\lambda/4$  or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

TABLE 1 TO §1.1307(b)(3)(i)(C)—SINGLE RF SOURCES SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	$1,920 R^2$ .
1.34-30	$3,450 R^2/f^2$ .
30-300	$3.83 R^2$ .
300-1,500	$0.0128 R^2 f$ .
1,500-100,000	$19.2 R^2$ .

(ii) For multiple RF sources: Multiple RF sources are exempt if:

(A) The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required). This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(i)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(i)(A).

(B) in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure Limit_k} \leq 1$$

Where:

a = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(B) of this section for P<sub>th</sub>, including existing exempt transmitters and those being added.

b = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(C) of this section for Threshold ERP, including existing exempt transmitters and those being added.

c = number of existing fixed, mobile, or portable RF sources with known evaluation for the specified minimum distance including existing evaluated transmitters.

P<sub>i</sub> = the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source i at a distance between 0.5 cm and 40 cm (inclusive).

P<sub>th,i</sub> = the exemption threshold power (P<sub>th</sub>) according to paragraph (b)(3)(i)(B) of this section for fixed, mobile, or portable RF source i.

ERP<sub>j</sub> = the ERP of fixed, mobile, or portable RF source j.

ERP<sub>th,j</sub> = exemption threshold ERP for fixed, mobile, or portable RF source j, at a distance of at least λ/2π according to the applicable formula of paragraph (b)(3)(i)(C) of this section.

Evaluated<sub>k</sub> = the maximum reported SAR or MPE of fixed, mobile, or portable RF source k either in the device or at the transmitter site from an existing evaluation at the location of exposure.

Exposure Limit<sub>k</sub> = either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable RF source k, as applicable from §1.1310 of this chapter.

## RF Exposure evaluation

Limits for Maximum Permissible Exposure (MPE) for RF sources are defined in FCC 47 CFR “§1.1310 Radiation Exposure limits, paragraph (e)”:

**TABLE 1 to §1.1310(e)(1)—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)**

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
<b>(i) Limits for Occupational/Controlled Exposure</b>				
0.3-3.0	614	1.63	*(100)	≤6
3.0-30	1842/f	4.89/f	*(900/f <sup>2</sup> )	<6
30-300	61.4	0.163	1.0	<6
300-1,500			f/300	<6
1,500-100,000			5	<6
<b>(ii) Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	614	1.63	*(100)	<30
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	<30
30-300	27.5	0.073	0.2	<30
300-1,500			f/1500	<30
1,500-100,000			1.0	<30

f = frequency in MHz. \* = Plane-wave equivalent power density.

Each supported transmission technology will be evaluated to determine if it is in compliance with limits for Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields.

In order to perform the assessment, the following equations have been used for the calculations; these equations are accurate in the far-field of an antenna and will over-predict power density in the near field, where they could be used for making a "worst case" or conservative prediction:

$$\text{Power density: } S[\text{mW} / \text{cm}^2] = \frac{P_{E.I.R.P.}[\text{mW}]}{4\pi R[\text{cm}]^2}$$

Where:

$S$  = power density

$P_{E.I.R.P.}$  = Equivalent isotropically radiated power

$R$  = distance to the center of radiation of the antenna (evaluation distance)

$$P_{E.I.R.P.} = P_T + G_T - L_C$$

Where:

$P_T$  = transmitter output power (including tune-up tolerance)

$G_T$  = gain of the transmitting antenna

$L_C$  = signal attenuation in the connecting cable between the transmitter and the antenna if applicable

### **Simultaneous transmission assessment:**

When multiple sources are introduced into an environment, it becomes necessary to address the sources interdependently, since each source will contribute some percentage of the maximum exposure toward the total exposure. The sum of the ratios of the exposure from each source to the corresponding maximum exposure for the frequency of each source must be evaluated.

The exposure complies with the maximum permissible exposure if the sum of the ratios is less than unity:

$$\sum_{i=1}^n \frac{S_i}{Lim_i}$$

Where:

$S_i$  is the applicable contribution of each source (e.g. power flux density).

$Lim_i$  is the limit for the applicable contribution of each source (e.g. MPE power flux density basic restriction).