中认信通
CHINA CERTIFICATION ICT CO., LTD (DONGGUAN)

ACCREDITED
TESTING LABORATORY
CERTIFICATE # 6356.01

MAXIMUM PERMISSIBLE EXPOSURE EVALUATION REPORT

Applicant: **Shenzhen Qianyan Technology LTD**

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FCC ID: **2A7VD-H5127**
IC: **28789-H5127**
HVIN: **H5127**
Product Name: **Presence Sensor**
Standard(s): **47 CFR §1.1310, 47 CFR §2.1091, 47 CFR §15.247(i),47 CFR §15.407(f) RSS-102 Issue 5 March 2015,Amendment 1 (February 2, 2021)**

The above equipment has been tested and found compliant with the requirement of the relative standards by China Certification ICT Co., Ltd (Dongguan)

Report Number: **CR230740506-00E**

Date Of Issue: **2023/8/7**

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Test Facility

The Test site used by China Certification ICT Co., Ltd (Dongguan) to collect test data is located on the No. 113, Pingkang Road, Dalang Town, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 442868, the FCC Designation No. : CN1314.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0123.

Declarations

China Certification ICT Co., Ltd (Dongguan) is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol "▲". Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	CR230740506-00E	Original Report	2023/8/7

1. SUMMARY OF TEST RESULTS

Standard(s)/Rule(s)	Description of Test	Result
§15.247 (i) & §1.1310 & §2.1091	Maximum Permissible Exposure (MPE)	Compliant
RSS-102 Clause 2.5.2	Exemption Limits For Routine Evaluation- RF Exposure Evaluation	Compliant

2. RF EXPOSURE EVALUATION

2.1 §15.407 (f) & §1.1310 & §2.1091-Maximum Permissible Exposure (MPE)

2.1.1 Applicable Standard

According to subpart 15.247(i)and subpart §1.1310, 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 level in excess of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (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;

According to §1.1310 and §2.1091 RF exposure is calculated.

2.1.2 Calculation formula:

Prediction of power density at the distance of the applicable MPE limit
$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm^2);
P = power input to the antenna (in appropriate units, e.g., mW);
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

2.1.3 Calculated Data:

Mode	Frequency (MHz)	Antenna Gain		Conducted output power including Tune-up Tolerance		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
		(dBi)	(numeric)	(dBm)	(mW)			
BLE	2402-2480	4.3	2.69	6	3.98	20.00	0.0021	1.0
2.4G Wifi	2412-2462	4.3	2.69	18	63.1	20.00	0.0338	1.0
Radar*	24025-24225	8	6.31	-3.88	0.41	20.00	0.0005	1.0

Note:
*:Radar the field strength is 91.32dBμV/m@3m = -3.88 dBm EIRP
E[dBμV/m] = EIRP[dBm] + 95.2 for d = 3 m
The Conducted Power including Tune-up Tolerance and EIRP(Radar) was declared by manufacturer

For Simultaneous transmission:

BLE and 2.4G WiFi can`t transmit simultaneously,
BLE/2.4G WiFi can transmit simultaneously with Radar:

$$\sum_i \frac{S_i}{S_{Limit,i}}$$

$=S_{2.4G\ WiFi}/S_{limit-\ 2.4G\ WiFi} + S_{\ Radar}/S_{limit-\ Radar}$

$=0.0338/1+0.0005/1$

$=0.0343$

< 1.0

Result: The device meet FCC MPE at 20 cm distance

2.2 Exemption limits for Routine Evaluation –RF Exposure Evaluation

2.2.1 Applicable Standard

According to RSS-102 § (2.5.2):

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2}\ f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

2.2.2 Calculated Data:

Mode	Frequency (MHz)	Antenna Gain	Conducted output power including Tune-up Tolerance	EIRP		Exemption limits (mW)
		(dBi)	(dBm)	(dBm)	(mW)	
BLE	2402-2480	4.3	6	10.3	10.72	2676
2.4G Wifi	2412-2462	4.3	18	22.3	169.82	2684
Radar*	24025-24225	8	-11.88	-3.88	0.41	5000

Note:
*:Radar the field strength is 91.32dBμV/m@3m = -3.88 dBm
E[dBμV/m] = EIRP[dBm] + 95.2 for d = 3 m

So the device is compliance exemption from Routine Evaluation Limits –RF exposure Evaluation.

Result: Compliance

===== END OF REPORT =====