RF EXPOSURE REPORT

Report No.: 17020360-FCC-H1
Supersede Report No.: N/A

Applicant	Raycan Technology Co., Ltd. (Suzhou)
Product Name	Area radiation monitor
Model No.	RadWall
Serial Model	RadWall-H, RadWall-W, RadWall-Ne
Test Standard	FCC 2.1091
Test Date	December 19 to December 27, 2017
Issue Date	December 27, 2017
Test Result	☑ Pass ☐ Fail
Equipment complied with the specification	☑
Equipment did not comply with the specification	☐

Trety Lu	Deon Dai	
Trety Lu Test Engineer	Deon Dai Engineer Reviewer	

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Test result presented in this test report is applicable to the tested sample only

Issued by:
SIEMIC (Nanjing-China) Laboratories
2-1 Longcang Avenue Yuhua Economic and
Technology Development Park, Nanjing, China
Tel:+86(25)86730128/86730129 Fax:+86(25)86730127 Email: China@siemic.com.cn

Laboratories Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.

In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Scope
USA	EMC, RF/Wireless, SAR, Telecom
Canada	EMC, RF/Wireless, SAR, Telecom
Taiwan	EMC, RF, Telecom, SAR, Safety
Hong Kong	RF/Wireless, SAR, Telecom
Australia	EMC, RF, Telecom, SAR, Safety
Korea	EMI, EMS, RF, SAR, Telecom, Safety
Japan	EMI, RF/Wireless, SAR, Telecom
Singapore	EMC, RF, SAR, Telecom
Europe	EMC, RF, SAR, Telecom, Safety

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1 Report Revision History

Report No.	Report Version	Description	Issue Date
17020360-FCC-H1	NONE	NONE	December 27, 2017

2 Customer information

Applicant Name	Raycan Technology Co., Ltd. (Suzhou)
Applicant Add	Bldg 17, 8 Jinfeng Road, SND, Suzhou
Manufacturer	Raycan Technology Co., Ltd. (Suzhou)
Manufacturer Add	Bldg 17, 8 Jinfeng Road, SND, Suzhou

3 Test site information

Lab performing tests	SIEMIC (Nanjing-China) Laboratories
Lab Address	2-1 Longcang Avenue Yuhua Economic and Technology Development Park, Nanjing, China
FCC Test Site No.	694825
IC Test Site No.	4842B-1
Test Software	EZ_EMC

4 Equipment under Test (EUT) Information

Description of EUT:	Area radiation monitor
Main Model:	RadWall
Serial Model:	RadWall-H, RadWall-W, RadWall-Ne
Date EUT received:	December 06, 2017
Test Date(s):	December 19 to December 27, 2017
Output power	21.251 dBm
Antenna Gain:	Zigbee:3 dBi
Type of Modulation:	Zigbee: QPSK
RF Operating Frequency (ies):	Zigbee:2405-2480 MHz
Number of Channels:	Zigbee:16CH
Port:	Power Port, USB Port
Input Power:	AC/DC Adapter: Model: SK02T-0500200U INPUT: 100-240V~50/60Hz 0.35A OUTPUT: DC5V 2A Battery: DC3.7V 4000mAh 14.8Wh
Trade Name :	RAYCAN
FCC ID:	2ALQQ-RADWALL

5 FCC §2.1091 - MaximuM Permissible exposure (MPE)

Applicable Standard

According to §1.1307(b)(1), 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.

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

Limits for General Population/Uncontrolled Exposure

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

Test Data

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

Where: S = power density (in appropriate units, e.g. mW/cm2)
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)

Type	Test mode	CH	Freq (MHz)	Conducted Power (dBm)	Tune Up Power (dBm)
Output power	Zigbee	Low	2405	21.251	20.5±1
		Mid	2440	20.844	20.0±1
		High	2480	20.377	19.5±1

For the antenna manufacturer provide only used limited to ERP/EIRP or radiated spurious emission test. The MPE evaluation as below:

Zigbee:
The maximum peak output power (turn-up power) in low channel of Zigbee is 21.5dBm
Maximum peak output power (turn-up power) at antenna input terminal: 141.254 (mW)
Prediction distance: >20 (cm)
Predication frequency: 2405(MHz) lowest frequency
Antenna Gain (typical): 3 (dBi)
Antenna Gain (typical): 1.995 (numeric)
The worst case is power density at predication frequency at 20 cm: 0.0561(mW/cm^2)
MPE limit for general population exposure at prediction frequency: 1 (mW/cm^2)

0.0561(mW/cm^2) < 1(mW/cm^2)

The maximum peak output power (turn-up power) in Middle channel of Zigbee is 21 dBm
Maximum peak output power (turn-up power) at antenna input terminal: 125.893(mW)

Prediction distance: >20 (cm)
Predication frequency: 2440(MHz) lowest frequency
Antenna Gain (typical): 3 (dBi)
Antenna Gain (typical):1.995 (numeric)
The worst case is power density at predication frequency at 20 cm: 0.0500(mW/cm^2)
MPE limit for general population exposure at prediction frequency: 1 (mW/cm^2)

0.0500(mW/cm^2) < 1(mW/cm^2)

The maximum peak output power (turn-up power) in High channel of Zigbee is 20.5dBm
Maximum peak output power (turn-up power) at antenna input terminal: 112.202 (mW)

Prediction distance: >20 (cm)
Predication frequency: 2480(MHz) lowest frequency
Antenna Gain (typical):3 (dBi)
Antenna Gain (typical):1.995(numeric)
The worst case is power density at predication frequency at 20 cm: 0.0445(mW/cm^2)
MPE limit for general population exposure at prediction frequency: 1 (mW/cm^2)

0.0445 (mW/cm^2) < 1(mW/cm^2)
Result: Pass