

RF EXPOSURE REPORT



Report No.: 17070831-FCC-H

Applicant	99iot(Shenzhen)co.,ltd	
Product Name	WIFI Module	
Model No.	AF-W121T	
Serial No.	N/A	
Test Standard	FCC 2.1091:2016	
Test Date	September 01 to October 09, 2017	
Issue Date	October 10, 2017	
Test Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
Equipment complied with the specification		<input checked="" type="checkbox"/>
Equipment did not comply with the specification		<input type="checkbox"/>
Loren Luo	David Huang	
Loren Luo Test Engineer	David Huang Checked By	
This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only		

Issued by:

SIEMIC (SHENZHEN-CHINA) LABORATORIES

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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
17070831-FCC-H	NONE	Original	October 10, 2017

2. Customer information

Applicant Name	99iot(Shenzhen)co.,ltd
Applicant Add	Room 609C North cangsong building, No 7 tairan road, Futian district, Shenzhen, China
Manufacturer	99iot(Shenzhen)co.,ltd
Manufacturer Add	Room 609C North cangsong building, No 7 tairan road, Futian district, Shenzhen, China

3. Test site information

Lab performing tests	SIEMIC (Shenzhen-China) LABORATORIES
Lab Address	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108
FCC Test Site No.	535293
IC Test Site No.	4842E-1
Test Software	Labview of SIEMIC version 2.0

4. Equipment under Test (EUT) Information

Description of EUT: WIFI Module

Main Model: AF-W121T

Serial Model: N/A

Equipment Category : DTS

Antenna Gain: 2dBi

Antenna Type: PCB antenna

Input Power: N/A

Trade Name : 99IoT

FCC ID: 2ANN4-99IOTW121

Type of Modulation: 802.11b/g/n: DSSS, OFDM

RF Operating Frequency (ies):
WIFI: 802.11b/g/n(20M): 2412-2462 MHz
WIFI: 802.11n(40M): 2422-2452 MHz

Number of Channels: 79CH

Date EUT received: August 31, 2017

Test Date(s): September 01 to October 09, 2017

5. FCC §2.1091 - Maximum Permissible exposure (MPE)

6.1 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

6.2 Test Result

Type	Test mode	CH	Freq (MHz)	Conducted Power (dBm)	Tune Up Power (dBm)
Output power	802.11b	Low	2412	16.15	15.5±1
		Mid	2437	16.29	15.5±1
		High	2462	16.34	15.5±1
	802.11g	Low	2412	13.48	13±1
		Mid	2437	13.90	13±1
		High	2462	13.88	13±1
	802.11n (20M)	Low	2412	12.41	12±1
		Mid	2437	12.61	12±1
		High	2462	12.68	12±1
	802.11n (40M)	Low	2422	12.39	12±1
		Mid	2437	12.50	12±1
		High	2452	12.71	12±1

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)

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

Maximum output power at antenna input terminal: 16.5(dBm)

Maximum output power at antenna input terminal: 44.668(mW)

Prediction distance: >20 (cm)

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Predication frequency: 2462 (MHz) High frequency

Antenna Gain (typical): 2 (dBi)

The worst case is power density at predication frequency at 20 cm: 0.01409(mW/cm²)

MPE limit for general population exposure at prediction frequency: 1.0 (mW/cm²)

0.01409 (mW/cm²) < 1.0 (mW/cm²)

Result: Pass