Scinan Internet of Things SNIOT621 Specification document

Version V1.0.3

目录

1 Product Overview

1.1 Summary

SNIOT621 WIFI module integrated micro controller (MCU) and 802.11 b/g/n 2.4GHz RF transceiver chip as a whole. Part of the RF module has passed the factory calibration test, customers can design interface circuit and communication module according to their own needs, and the network protocol has been embedded into the module, without any outside module settings, users in the through the use of portable equipment and automatic AP (family WIFI hotspot) connection; second is the soft AP, it can be connected with the.SNIOT621 module and intelligent equipment point to point to provide customers with a simple, low cost, reliable WIFI network product design; external need only provide a set of 3.3V power supply, the convenience of customers embedded in some mature products.

1.2 Module basic parameters

Module Technical Parameters

Characteristic	Function Realization
Power	3.3V±0.3V

Clock	26MHZ
Encapsulation	SIP
Wireless Characteristics	
General Characteristics	■ COMS MAC, Baseband physical layer, and a single chip and radio frequency in 802.11b/g/n IEEE ■ The 2.4GHZ complete 802.11n solution ■ It is compatible with the 802.11n standard ■ The operation of 802.11n mode is backward compatible with 802.11b / g equipment
Interface	■ UART, SPI, I2C, PWM ,GPIO
Support Standard	■ It is compatible with IEEE 802.11b/g/n

Items	Description
Describes protocols and standards for describe support	IEEE 802.11n, IEEE 802.11g,EE 802.11b

Interface Type	UART,I2C,GPIO,PWM
Frequency Range	2.2-2.484GHZ
Work Channel	1-11（USA,Canada）;1-13（China, Europe）;1-14（Japan）
Work Mode	SoftAP, station
Receiving Sensitivity （OFDM）	54M:-73.5dBm 12M:-88dBm 6M: -91.5dBm
Transmit Power	CCK 1-11Mbps @19db OFDM 54Mbps @16db HT20，MCS7 @15db
Antenna Connection	By IPEX external connection
Size(L*W*H)	17.1MM*17.0MM*3.1MM
Work Temperature	-10℃~70℃
Store Temperature	-55℃~125℃
Work Humidity	5%~90%

Current / Power Characteristics

Description	Parameters

	Typical Value	Unit
RX CCK, 1 Mbps	60	mA
RX Power saving, DTIM=1	1.2	mA
RX OFDM,54Mbps	66	mA
TX HT20, MCS7 @15dBm	223	mA
TX CCK, 1Mbps @19dBm	282	mA
Standby ModeSleep mode	200	uA

1.3 Main Application Areas

◆The Handheld Device

◆The Industrial Control

◆The remote monitoring equipment

◆The application of Internet of things

◆The industrial sensor and controller

◆The portable wireless communication product

◆The consumer electronics

1.4 WIFIModule Naming Rules

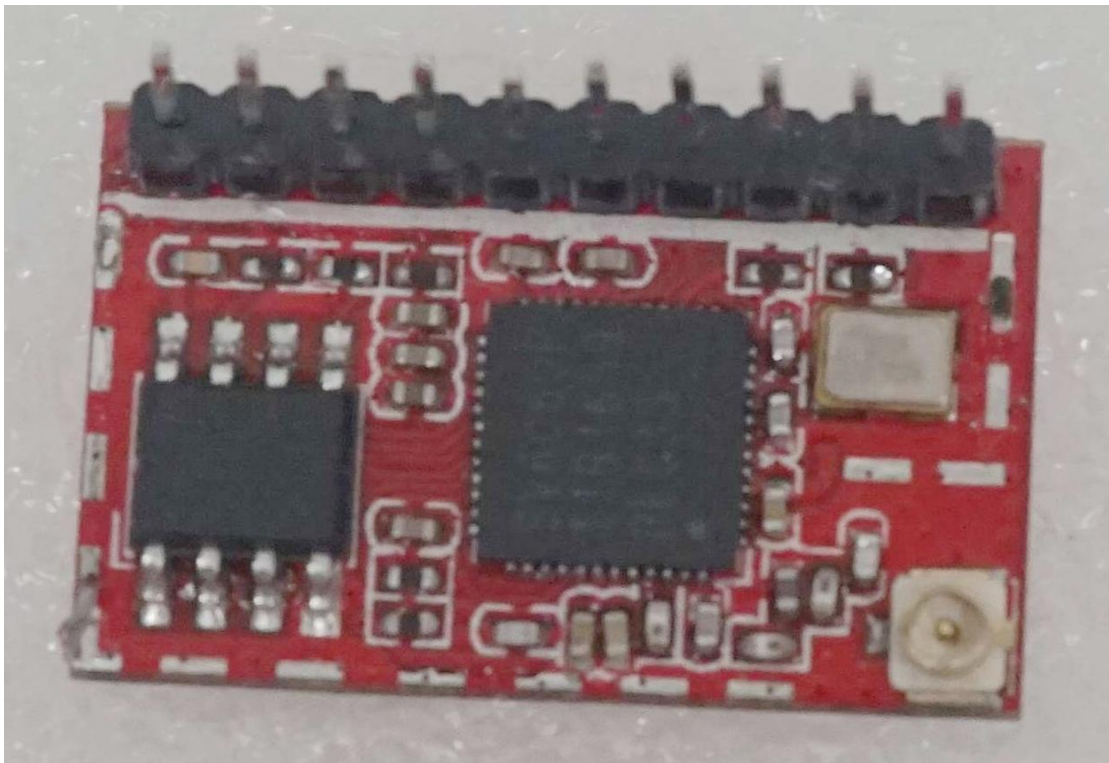ScinanIoTseries WIFI module naming rules are as follows:

ScinanIoTidentification+ type + Color + antenna mode

ScinanIoT ID	Type	Color	Antenna Mode	Remarks
SNIOT	SNIOT621	B2(Green) B3(Black)	E(Outer Antenna)	Square Patch

Eg1 :We provided customer "Red SNIOT621 Square Patch ,using Outer Antenna", then we make it as : SNIOT621R1E

2 Hardware Interface

2.1 Actual Picture

Module Front Actual Picture

Module Back Actual Picture

Declaration of EUT Family Grouping:

Model No.:SNIOT621B,SNIOT 621R.

According to the declaration from the applicant,the electrical circuit design,layout,components used and internal wiring were identical for all models,only with different colour (SNIOT621B:Black,SNIOT621R:Red) and silk-screen of Logo.
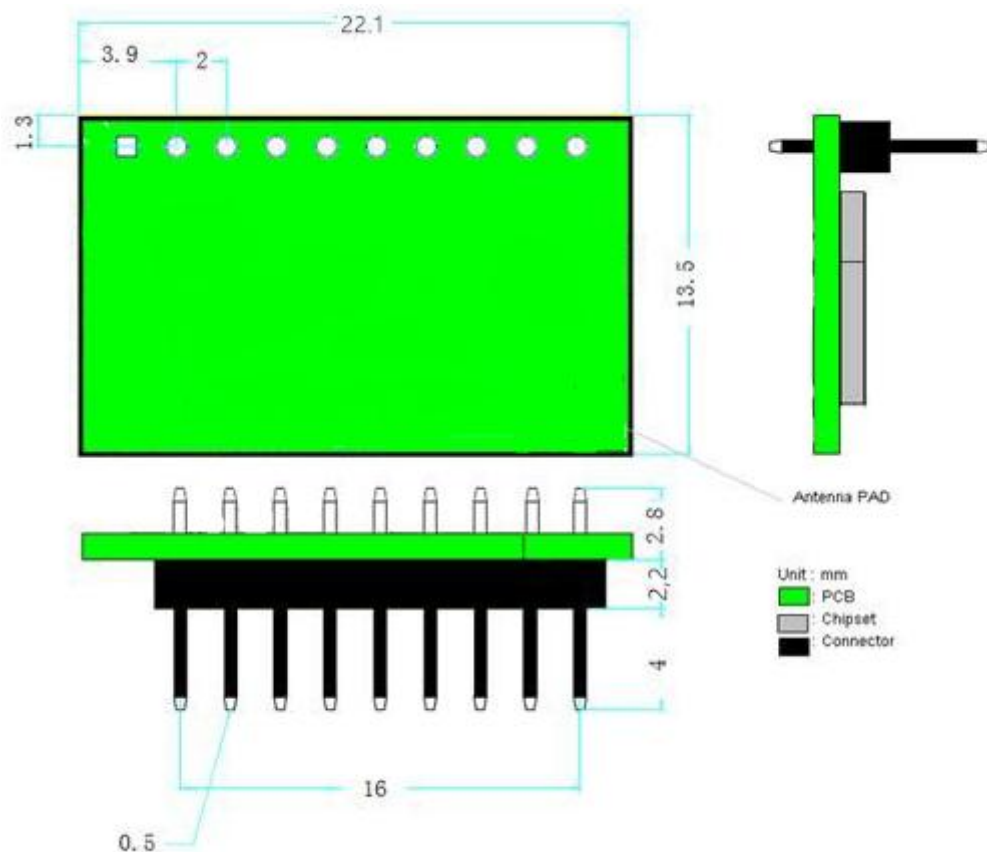
Therefore only one model SNIOT621R was tested in this Spec.

2.2Product Pins
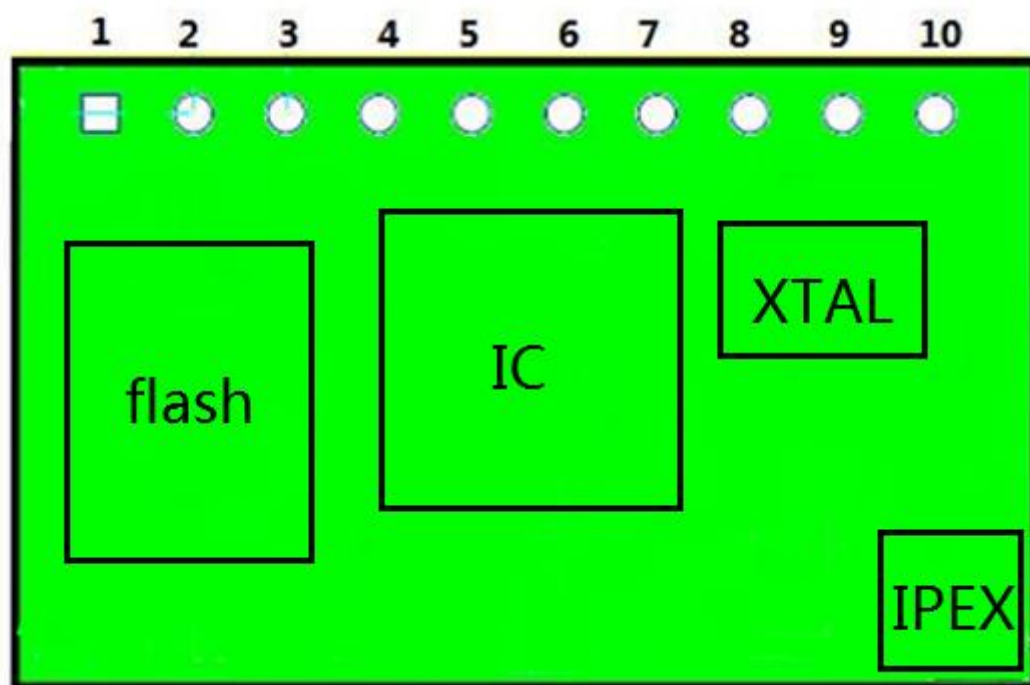
Pins Schematic Diagram

2.3 Product Size Chart

After the module has been added to the shield, its dimensions are as

follows :

Length: 22.1mm

Width: 13.5mm

Thickness: 5.0mm

2.4Pins Definition

Pins definition table

| Pin	description	Signal	Type	instruction	Withstand voltage range（V）
1	Ground	GND	Power		
2	+3.3V	DVDD	Power	3. 3V@500mA	
3	GPIO-0	GPIO	I/O	Please hang if not use	-0.3 to 3.6
4	Reset	EXT_RESETn	I,PU	low level rest input , please hang if not use	
5	UART0	UART0_RX	I	Please hang if not use, receive	-0.3 to 3.6
6	UART0	UART0_TX	O	Please hang if not use,transmission	-0.3 to 3.6
7	GPIO-1	GPIO	I/O	Please hang if not use	-0.3 to 3.6
8	GPIO-2	GPIO	I/O	Please hang if not use	-0.3 to 3.6
9	GPIO-3	GPIO	I/O	Please hang if not use	-0.3 to 3.6
10	GPIO-4	GPIO	I/O	Please hang if not use	-0.3 to 3.6

2.5 Routing Rules

The TX and G0 can not be pulled low when SNIOT621 power on, please note in the design.

2.6 Outer Antenna

SNIOT621 provides an external antenna interface, as shown below: I-PEX connector interface. If an external antenna is used, the SNIOT621 is connected to the 2.4G antenna according to the requirements of the IEEE802.11b/g/n standard. The parameters of the external antenna are listed in the table.
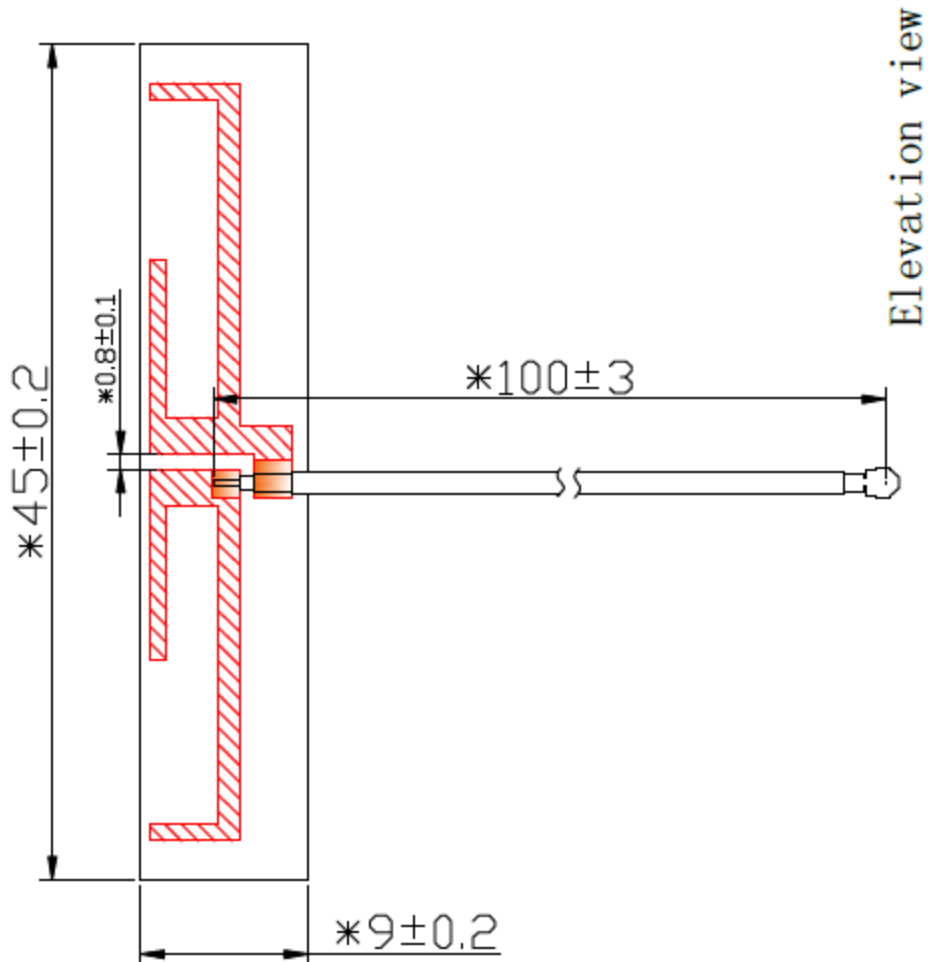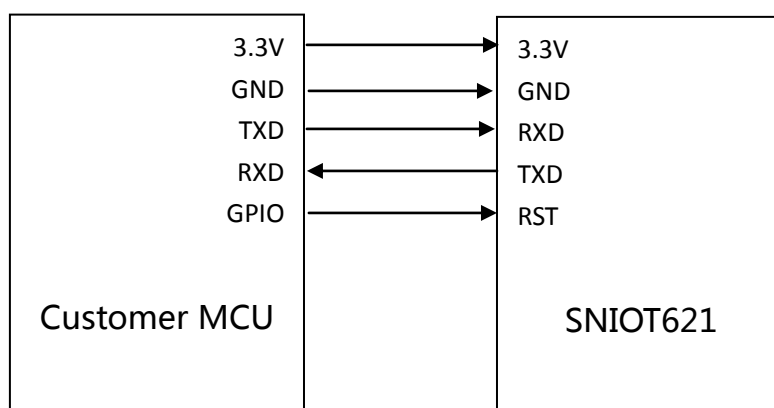

Schematic diagram of antenna

Outer antenna parameter requirements

Items	Parameter

Frequency Range	2.4~2.5GHz
Impedance	50Ohm
VSWR	2(Max)
Return Loss	-10dB(Max)
Connection Type	I-PEXorpopulatedirectly

3 Typical applications

3.1 Typical Hardware Wiring Diagram

Typical hardware wiring diagram

3.2 Signal Description

RXD/TXD - Serial data transceiver signal

Configurable parameters of serial port:

◆ Baud Rate

（300,600,1200,1800,2400,4800,9600,19200,38400,57600,115200

,230400,380400,460800,921600）

◆ Data Bits（8）

◆ Stop bit（1,2）

◆ Parity bit (no inspection, even inspection, odd inspection)

◆ The hardware flow control (no hardware flow control, hardware
flow control)

4 Communication Protocol

4.1 Single Byte Transformation format

The equipment andScinanIOT SNIOT621 module through the
serial port connection, the typical format of data transmission
requirements are as follows:

◆ Encoding System：ASCII Code

◆ Data Bits: 8 bit data, low starting

◆ Odd / Even Parity: no parity can be set to the default.

◆ Stop Bit: 1 bit by default, can be set up

◆ Baud Rate can be set: the default 115200bps(debug uart),
9600bps(user uart)

4.2 Communication frame format

Communication protocol is using the format to send and receive data content with carriage returns. Whenthe equipment is sending data Sinan linked SNIOT621 module, the data format is like '/S/1/actual data'; When SNIOT621 is sending data to the equipment, the data format s like '/S/1/actual data', too.

4.3 Communication protocol

The equipment and Scinan IOT SNIOT621 module through the serial communication, the function codes and the sending data are as following:

Type	Mode	Serial Code	Mode Selection	Remarks	Example
Equipment	All Status	S00			/S00/1/-1\n
	SNIOT621 status	S80	Request	1: AP; 2 Connection; 3: Connected server; 4: Connected Router	/S80/1/3\n

	Change AP Mode	S99			/S99/1/1\n

Remark：SNIOT621 sends control command;the equipment must return

back all status as below:

/S00/1/data1,data2,data3,data4, data5,...,data N\n

4.4 Successful Case

Currently there are smart Air-source Water Heater, smart air cleaner, smart cooker hood, smart cooking utensils, smart disinfection cabinet, smart environment, smart temperature controller, smart light controller, etc. a variety of networking products through the way to achieve stable networking products.

Below is an example of smart light controller, the protocol format between WIFImodule and control board.

SNIOT621 sends control command to the equipment, the commands are as following:

Seq	Function Name	Function NO	Parameter Range	Example
1	Retrieve all status of equipment	S00	Fixed data:-1	Retrieve all status of equipment

				/S00/1/-1\n
2	Turn ON/Turn Off	S01	ON：1 OFF：0	Turn on light /S01/1/1\n
3	Switch ON/OFF Red light	S02	ON：1 OFF：0	Switch on Red light /S02/1/1 \n
4	Brightness	S03	0-100	Setting Brightness as 20 /S03/1/20\n
5	Red light value	S04	0-255	Setting Red light value as 200 /S04/1/200\n
6	Self-expand ing data	S05	Any data	/S05/1/data\n

APP active request equipment data or WIFImodule sends control command or every 1 hour, light control equipment must return back all status are as following:

1. WIFImodule sends any control command, the control broad must return back all status as following:

/S001/1/Turn ON/Turn Off,Switch ON/OFF Red light,Brightness,Red

light value,Self-expanding data\n

Retrieve status parameter range as below.

Seq	Function Name	Parameter Range
1	Turn ON/Turn Off	ON : 1 OFF : 0
2	Switch ON/OFF Red light	ON : 1 OFF : 0
3	Brightness	0-100
4	Red light value	OFF : 0 ON : 1 Cancel Timer : 2
5	Self-expanding data	Any data

Configuration module communication protocol:

When configuring module to connect router, light controller

equipment will send command /S99/1/1\n to recovery module to AP

mode.

WIFI module will send status command to light controller equipment according to the status of the connection periodically, light control equipment can be lit according to the status of the return of the corresponding LED lights.