



Scinan Internet of Things SNIOT601 Specification

Scinan Internet of Things

SNIOT601 Specification document

Version V1.0.1



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1 Product Overview

1.1 Summary

SNIOT601 WIFI module integrated micro controller (MCU) and 802.11 b/g/n 2.4GHz RF transceiver chip as a whole. UART and network data buffer is integrated in MCU. 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 SNIOT601 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
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Power	3.3V±0.3V
Clock	26MHZ
Encapsulation	SMD
Wireless Characteristics	
General Characteristics	<ul style="list-style-type: none">■ 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	<ul style="list-style-type: none">■ UART, SPI, I2C, PWM ,GPIO
Support Standard	<ul style="list-style-type: none">■ It is compatible with IEEE 802.11b/g/n

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



Interface Type	UART,I2C,GPIO,PWM
Frequency Range	2400-2483.5MHz
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°C~70°C
Store Temperature	-55°C~125°C
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 WIFI Module Naming Rules

ScinanIoTseries WIFI module naming rules are as follows:

ScinanIoT identification + type + Color + antenna mode

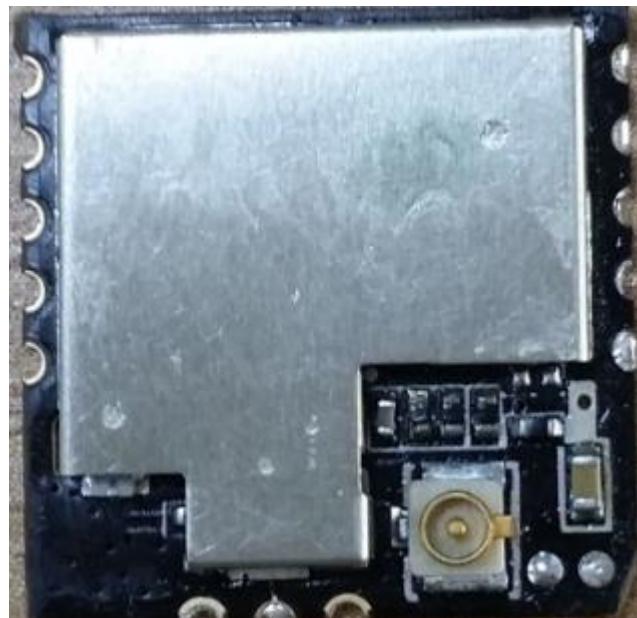
ScinanIoT ID	Type	Color	Antenna Mode	Remarks
SNIOT	SNIOT601	B2(Green) B3(Black)	E(Outer Antenna)	Square Patch

Eg1 : We provided customer "Black SNIOT601Square Patch , using

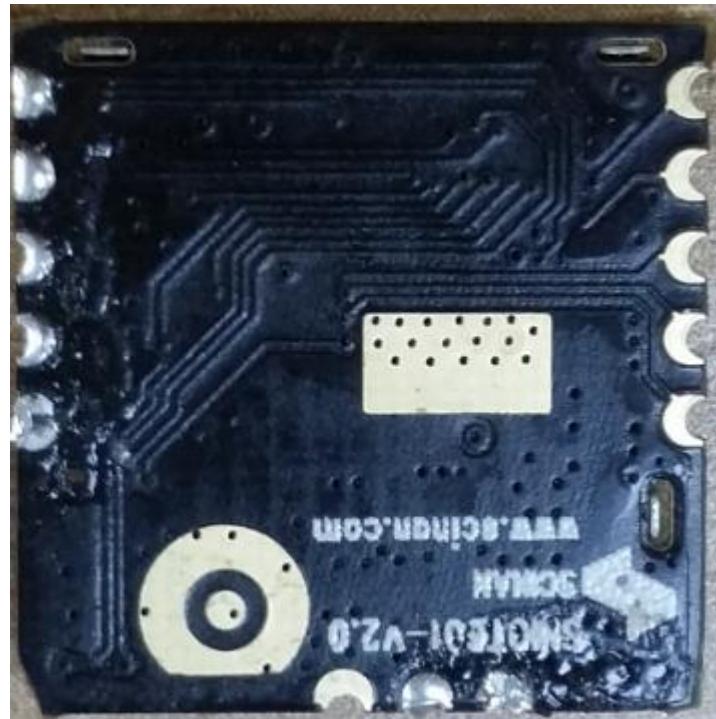
Outer Antenna" , then we make it as : SNIOT601B2E

2 Hardware Interface

2.1 Actual Picture



Module Front Actual Picture



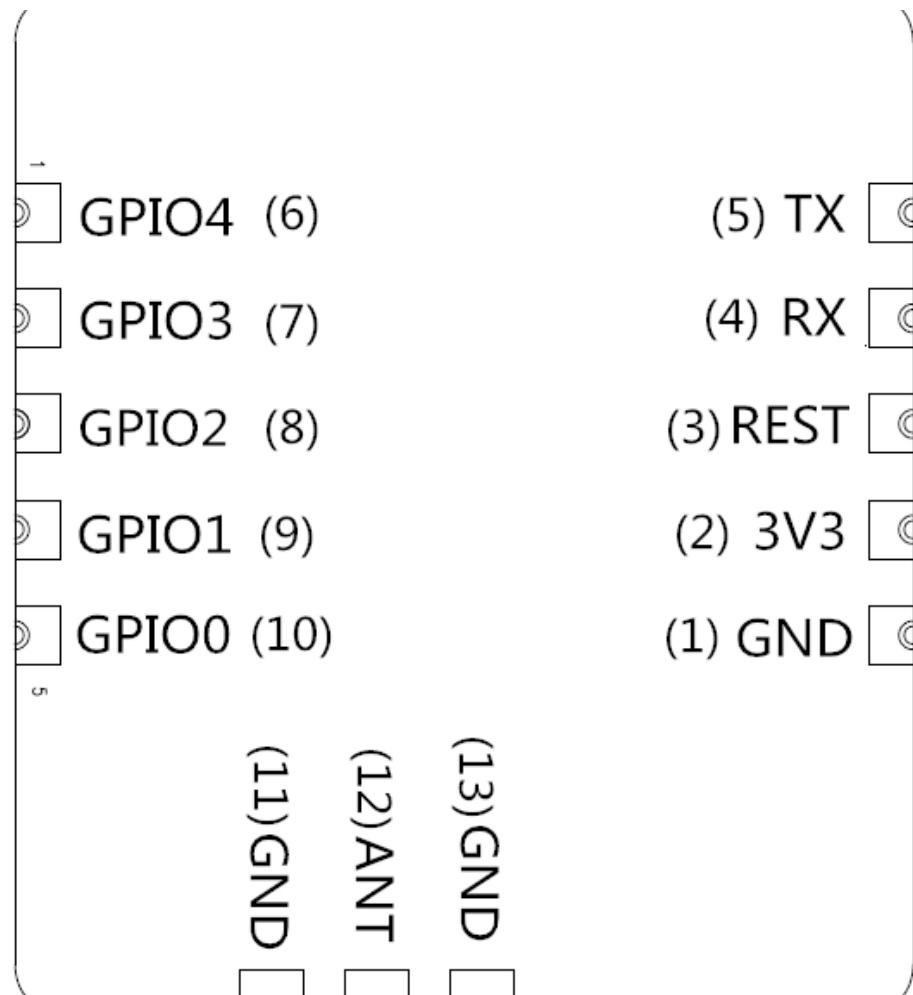
Module Back Actual Picture

The module in this product is labeled with its own FCC ID No.. The FCC ID is not visible when the module is installed inside another device.

Therefore, the outside of the device into which the module is installed must also display a label referring to the module. The final end device must be labeled in a visible area with the following

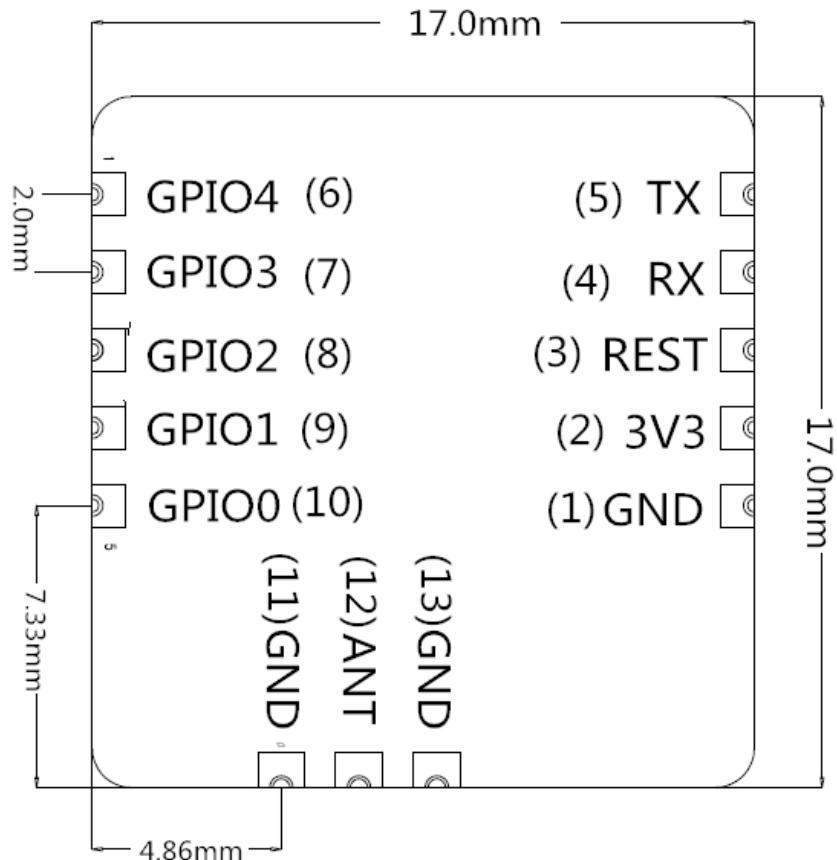
"Contains FCC ID: 2AFO5SCINANSNIOT601

2.2 Product Pins



Pins Schematic Diagram

2.3 Product Size Chart



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

Length: 17.1mm

Width: 17.0mm

Thickness: 3.10mm

2.4 Pins Definition

Pins definition table

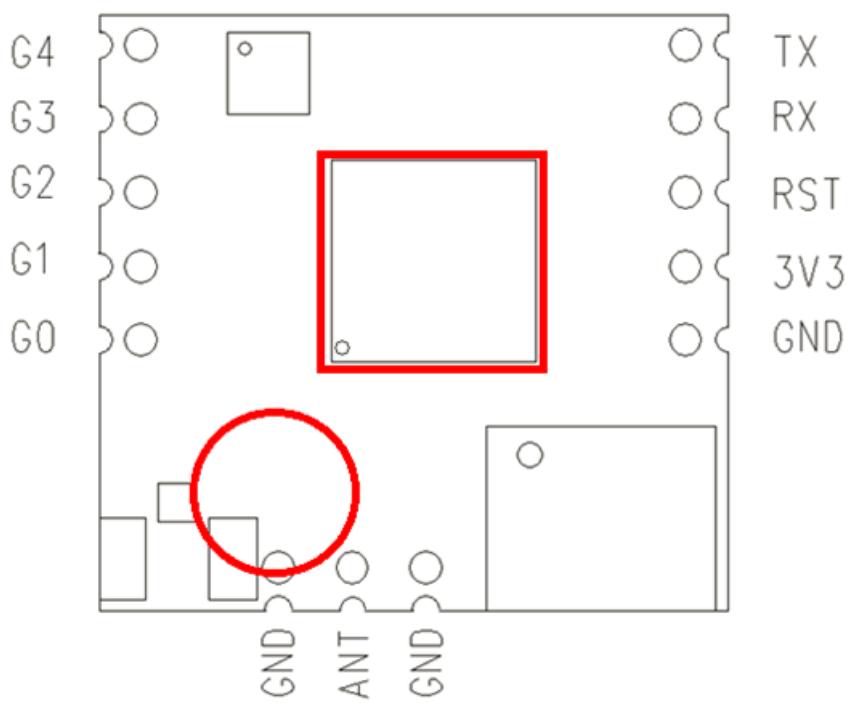


Pin Seq	Type	Description	Processing Instructions	Withstand Voltage Range (V)
1	P	GND	GND	
2	INPUT	Digital I/O power supply	3V3	
3	INPUT	External system reset active low	RST	
4	IN	UART RX		-0.3 to 3.6
5	OUT	UART TX		-0.3 to 3.6
6	IN/OUT	Programmable input/output	GPIO4	-0.3 to 3.6
7	IN/OUT	AP KEY	GPIO3	-0.3 to 3.6
8	IN/OUT	WIFI LED	GPIO2	-0.3 to 3.6
9	IN/OUT	Programmable input/output	GPIO1	-0.3 to 3.6
10	IN/OUT	Programmable input/output	GPIO0	-0.3 to 3.6
11	P	GND	GND	
12	ANT	ANT	ANT Optional	
13	P	GND	GND	

2.5 Routing Rules

TX and G0 can not be pulled low when SNIOT601 power on start ,Please take note when customers design circuit and serial port initial.

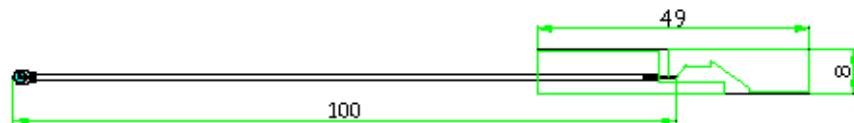
WIFI module is under the red area to prevent exposure to copper, in case of short circuit, refer below figure:



2.6 Outer Antenna

SNIOT601 provided 2 type Outer antenna interface, refer below figure:The I-PEX connector interface and the welding tray lead wire interface (not welded PEX I- connector), can be selected by the user according to their needs. If using outer antenna, according to the requirements of the IEEE802.11b/g/n standard, SNIOT601 is required to

connect to the 2.4G antenna. The parameters of the external antenna are listed in detail in the table.



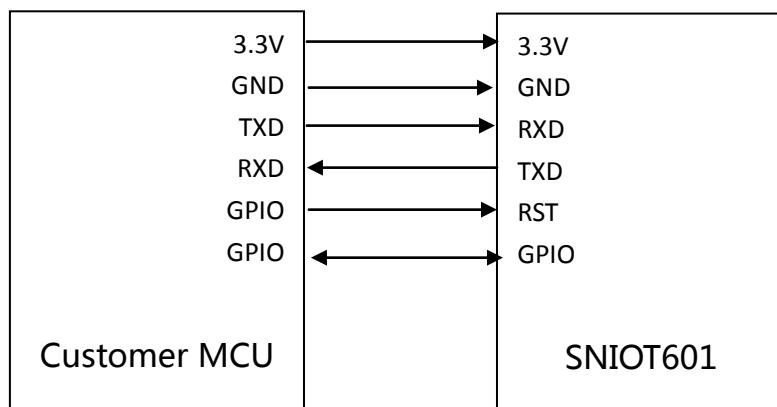
Schematic diagram of antenna

Outer antenna parameter requirements

Items	Parameter
Frequency Range	2.4~2.5GHz
Impedance	50Ohm
VSWR	≤ 1.5
Return Loss	-10dB(Max)
Connection Type	I-PEX or populated directly

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 and ScinanIOT SNIOT601 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

4.2 Communication frame format

Communication protocol is using the format to send and receive data content with carriage returns. When the equipment is sending data to the Sinan linked SNIOT601 module, the data format is like '/S/1/actual data' ; When SNIOT601 is sending data to the equipment, the data format is like '/S/1/actual data' , too.

4.3 Communication protocol

The equipment and Scinan IOT SNIOT601 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	Request		/S00/1/-1\n
	SNIOT601	S80		1: AP;	/S80/1/3\n



	status			2 Connection; 3: Connected server; 4: Connected Router	
	Change AP Mode	S99			/S99/1/1\n

Remark : SNIOT601 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.

SNIOT601 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-expanding data	S05	Any data	/S05/1/data\n



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

1. WiFi module 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.

5 Caution

Caution: The user is cautioned that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.



NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.



This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.