

# SNIOT3131

## Bluetooth 5.0 **Data sheet**

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## 简介

### Bluetooth 5.0

- Support classic Bluetooth and BLE dual mode
- Support 2.4G low power transceiver
- Integrated ARM968E core microprocessor
- 160KB programmable flash memory and 20KB RAM
- The supply voltage is 0.9V to 3.6V
- 16MHz reference clock
- 64MHz phase-locked loop clock
- 32KHz ring oscillator
- External 32KHz crystal oscillator

#### • Support configuration files

- Support classic Bluetooth and BLE dual mode
- Sensors, sports and fitness, beacons
- Alert and timer profiles
- HID (keyboard, remote)
- Anti-loss device
- Digital electricity meters

#### • Interfaces and external devices

- UART\*2 ports
- JTAG, SPI, and I2C interfaces
- Multi-channel PMW output
- GPIO
- True random number generator
- ADC

- **I/O Overview**
- 20 Universal I/Os
- 6 Analog I/O (10bit ADC)
- Operating voltage: 1.8-3.6V
- Size: 16.8\*12.6\*1.2mm
- Operating temperature: -20 to 85°C

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## 1. 描述 Product overview

SNIOT3131 is a cost-effective Bluetooth module that uses the SNIOT3130 chip to support Bluetooth V5.0

The ARM968E has a core, 20K RAM, Bluetooth long range, big data features, and SIGmesh support.

The module provides all Bluetooth® low power features 5.0: Broadcast, Stack, client application profiles, and Application Space,

So no external processor is needed. The module also provides flexible hardware interfaces to connect sensors. This module can use the label directly

Quasi-3v coin battery or a pair of AAA battery power. In minimum power sleep mode, it consumes only 1.6uA(with no RAM retained and external interrupts enabled), and will wake up in hundreds of microseconds.

## 2. 基本特性 Features:

### Bluetooth Profiles

※Bluetooth® SIG Bluetooth Dual Mode 5.0 compliant

※Low-power 2.4GHz Transceiver

※ARM968E Core Microprocessor integrated

※160 KB programmable Flash for Program and 20 KB RAM for Data

- ※Operation voltage from 1.2 to 3.6V
- ※16 MHz crystal reference clock
- ※64 MHz digital PLL clock
- ※32 kHz ring oscillator
- ※External 32KHz crystal oscillator
- ※MCU can run with any clock source with internal frequency divider
- ※JTAG, I2C, SPI, UART interface
- ※Multi-channels PWM output
- ※On-chip 10 bit general ADC
- ※GPIO with multiplexed interface functions
- ※True random number generator

## 2.1 性能参数 performance parameter:

### 2.2 建议工作条件 Recommended working conditions

operating specification	Min	Typical	Max	Unit
operating temperature range	-40	-	+85	°C
Battery (VDD BAT) operation	2.0	+3.0	+3.6	V
I/O Power Supply (VDD PIO)	1.2	+3.0	+3.6	V
AIO input	0	-	+1.5	V
frequency range	240 2		2480	MHz

### 2.3 最大额定功率 Maximum rated power

operating specification	Min	Max	Unit
storage temperature	-40	+125	°C
Battery (VBAT) operation	2.0	+3.6	V
I/O power supply	1.2	+3.6	V

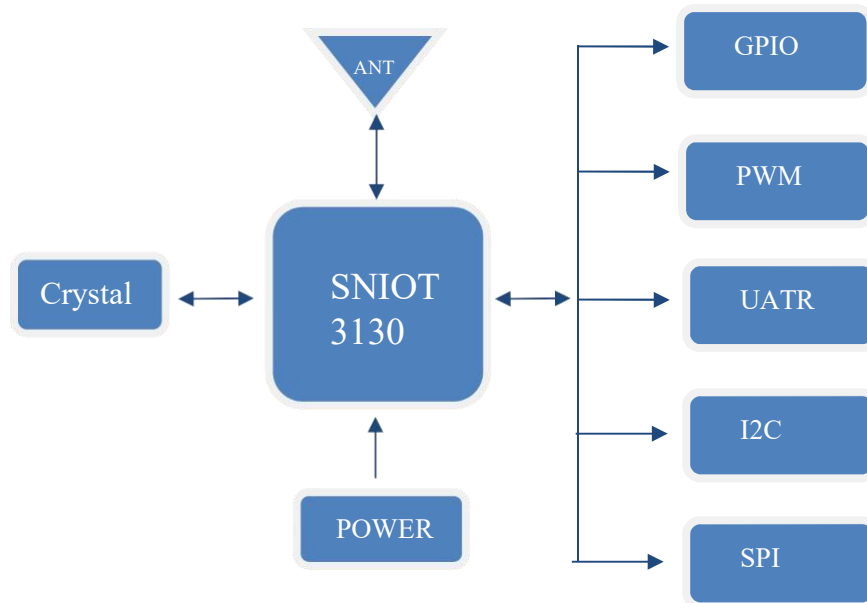
### 2.4 输入/输出 终端特性 I/O terminal characteristics

operating specification	Min	Typical	Max	Unit
operating temperature range	-40	-	85	°C
VIL Input logic low level	VSS	-	VSS+0.3	V
VIH Input logic high level	VCC- 0.3	-	VCC+0. 3	ns

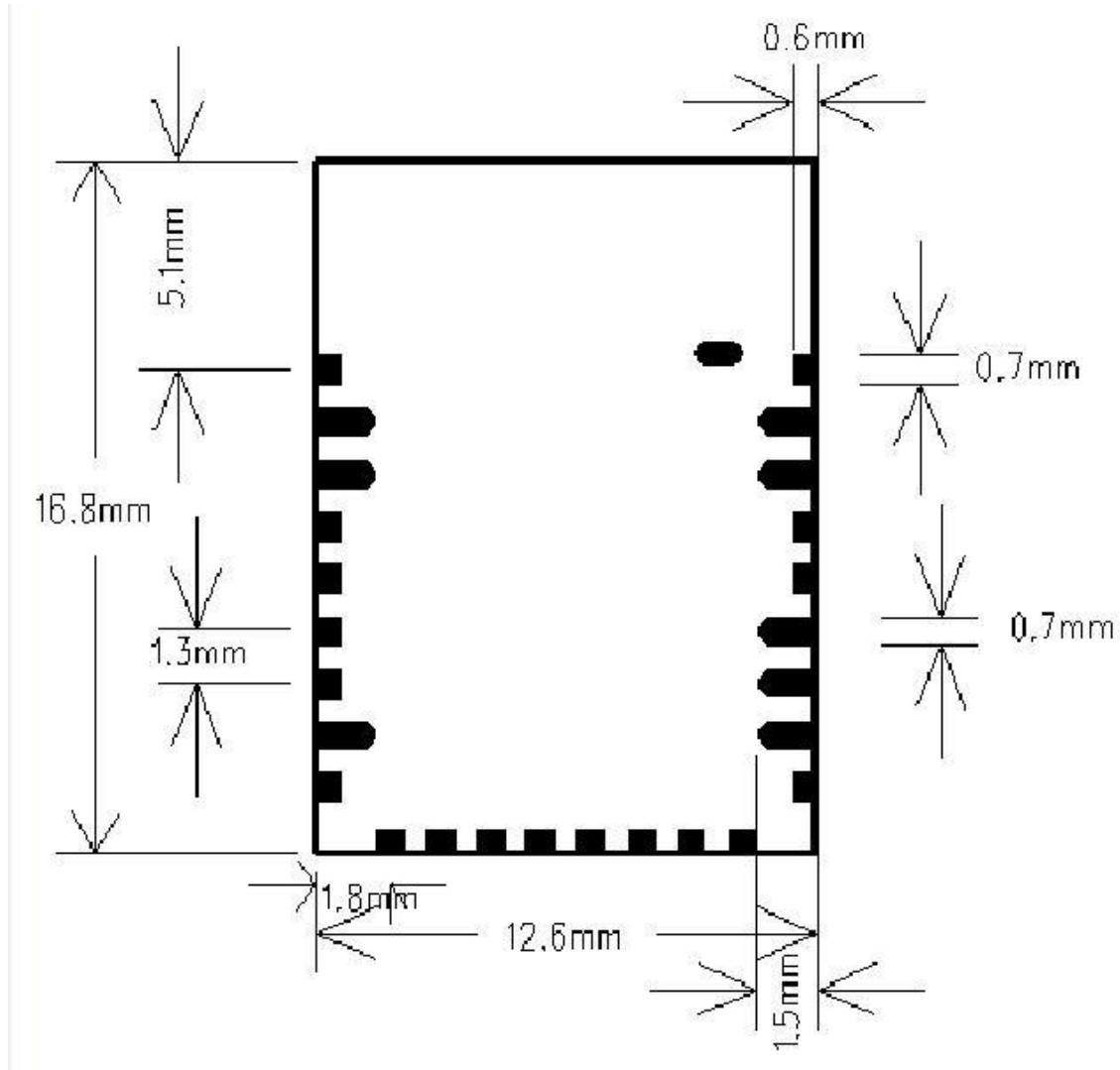
output level	Min	Typical	Max	Unit
VOL output logic low level, IOL = 0.25mA (Maximum driving current)	VSS	-	VSS+0.3	
VOH output logic high level,, IOL = -0.25mA (Maximum driving strength)	VCC-0.3	-	VCC+0.3	V
Input and three-state current	Min	Typical	Max	Unit
Pull-down resistance	3.5	4.7	6.0	KΩ
Weak pull-up	8	40	50	uA
CI input capacitance	-	5	-	pF



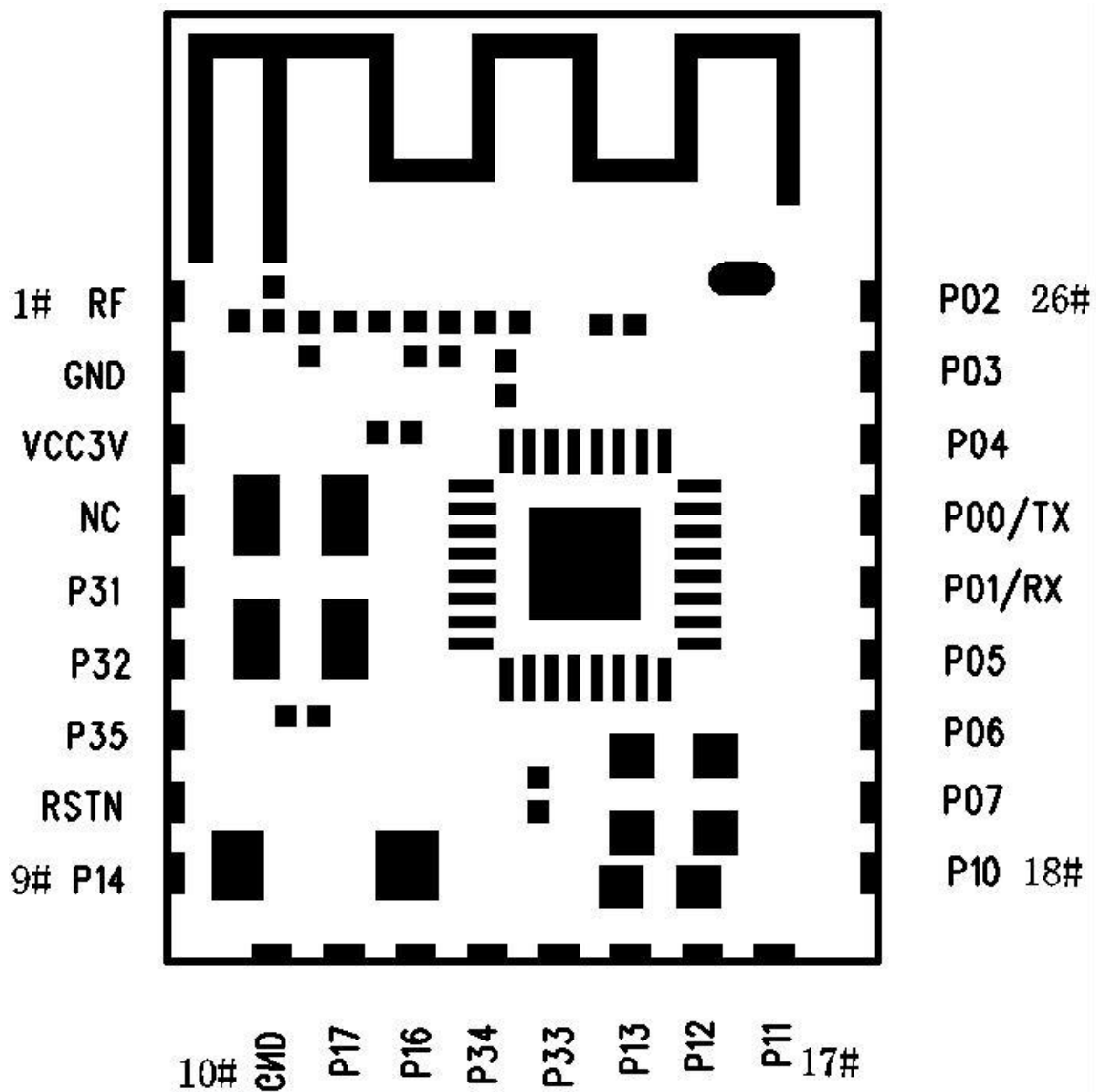
### 3. 方框图 Module block diagram:



#### 4. 模块尺寸图 The size of the module graph:



### 5. 模块脚位定义图 Device pin out diagram:



## 6. 引脚功能说明Pin definition:

Pin	Symb	I/O	Description
1	RF	RF	RF signal port
2	GND	GND	GND
3	VCC3V	Analog	Power, 3 V
4	NC	NC	NC
5	P31	Digital I/O	General purpose IO/ADC1
6	P32	Digital I/O	General purpose IO/ADC2
7	P35	Digital I/O	General purpose IO/ADC5
8	RSTN	Analog	Active low pin reset
9	P14	Digital I/O	General purpose IO/PMW4
10	GND	GND	GND
11	P17	Digital I/O	General purpose IO/RX2
12	P16	Digital I/O	General purpose IO/TX2
13	P34	Digital I/O	General purpose IO/ADC4
14	P33	Digital I/O	General purpose IO
15	P13	Digital I/O	General purpose IO
16	P12	Digital I/O	General purpose IO
17	P11	Digital I/O	General purpose IO
18	P10	Digital I/O	General purpose IO
19	P07	Digital I/O	General purpose IO
20	P06	Digital I/O	General purpose IO
21	P05	Digital I/O	General purpose IO
22	P01/RX	Digital I/O	GPIO1/UART1_RXD
23	P00/TX	Digital I/O	GPIO0/UART1_TXD
24	P04	Digital I/O	General purpose IO
25	P03	Digital I/O	General purpose IO/SDA
26	P02	Digital I/O	General purpose IO/SCL

## 7. 电路连接注意 Design notes:

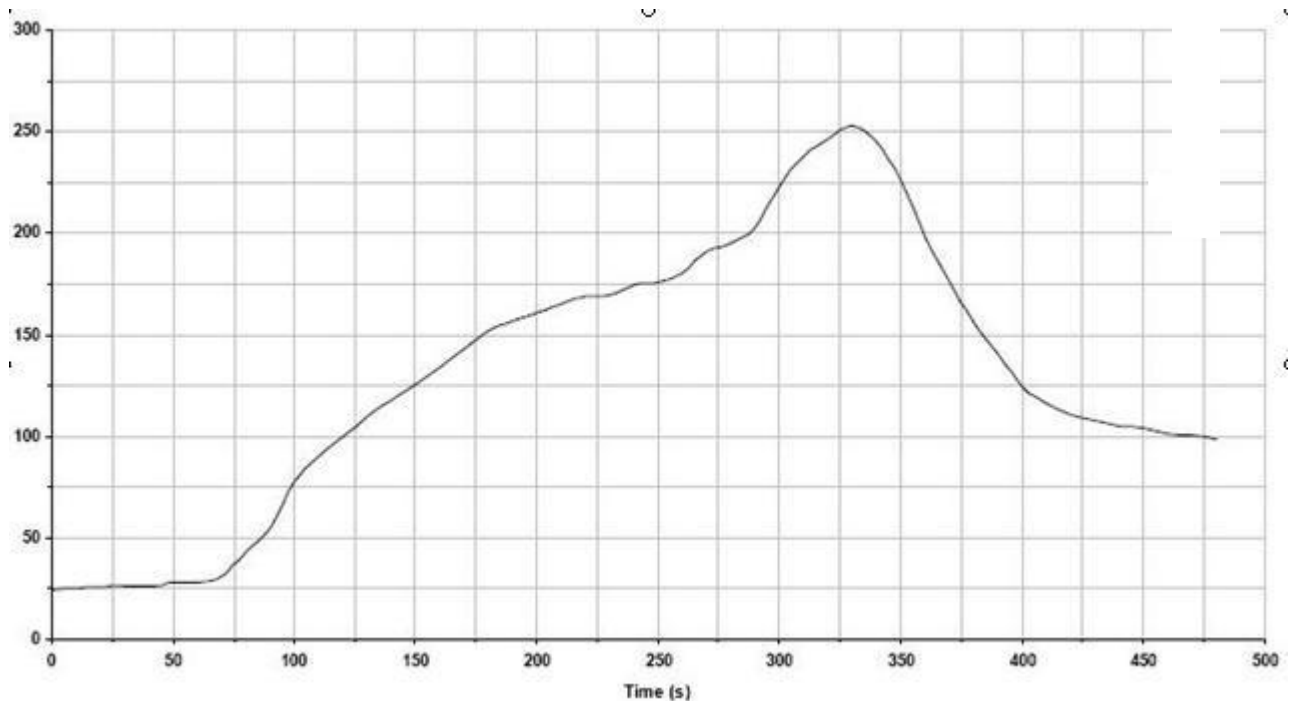
SNIOT3131中, 请注意避免功放、升压线路, DC/DC 电路等干扰源对模块的影响, 避免模块供电回路同大功率电路单元形成串联回路, 以此来提高整机SNR;

In order to better SNR, please pay attention to the hardware design of PA, DC booster, DC/ DC circuit and the module power circuit to avoid influencing module.

## 8. 注意事项Note:

- A. Regarding the use environment of wireless Bluetooth, wireless signals including Bluetooth applications are greatly affected by the surrounding environment, such as Obstacles such as trees and metals will absorb wireless signals to a certain extent, which will affect the distance of data transmission in practical applications.
- B. Since Bluetooth modules should be matched with the existing system, they should be placed in the shell. Due to the metal enclosure against radio frequency letters It has a masking function. Therefore, it is recommended not to install in metal housing.
- C. PCB cloth board: The antenna part of the Bluetooth module is the PCB antenna, because the metal will weaken the function of the antenna in the mold  
When the board is distributed, it is strictly prohibited to lay the floor and line under the module antenna. It is better if it can be hollowed out.
- D. If there are batteries, metal objects, LCD screens, speakers, etc. near the antenna of the module, the distance from the antenna should be at least 15mm
- E. layout, it is recommended to use star layout for power supply, and ensure that the linearity of Bluetooth module power supply is good. Besides, BT ground must be separated from the ground of operation amplifier, power amplifier, MCU, etc., and there should be no other interference on the lower side of BT
- F. Interference cables such as control cables, power cables, audio cables and MIC cables are not allowed around the antenna.
- G. If there is a row seat near the module antenna, the shell has a metal mesh, which has an impact on the signal, it is recommended to use professional high-gain antenna.

## 9. 推荐回流温度 Recommended reflow temperature:



Key features of the profile:

- Initial Ramp=1-2.5°C/sec to 175°C      equilibrium
- Equilibrium time=60 to 80 seconds
- Ramp to Maximum temperature (250°C)=3°C/sec Max
- Time above liquidus temperature(217°C): 45 - 90 seconds
- Device absolute maximum reflow temperature: 250°C

## 10. 应用原理图 Application schematic diagram:

参考原理图仅供参考应用!

Reference schematic diagram for reference purposes only!

**END!**