

VG5574SxxxNxS1 Wireless module

Hardware specification

V01



content

I .Application note.....	1
II.Technical parameter.....	4
I .Pin location map.....	5
IV.Pin description.....	6
VII.Reflow soldering curve.....	8
VIII.Electrostatic damage warning.....	8
IX.Package information.....	9
IX. I Mechanical Dimensions(unit:mm).....	9
X.Version update instructions.....	10
XI.Procurement Selection Table.....	10
XII.Statement.....	11
XIII.Contact us.....	11

I .Application note

VG5574SxxxNxS1 series wireless module, based on Silicon Labs' SI4463 high-performance wireless transceiver chip design, is a small, low-power, long-distance two-way wireless transceiver module.

Silicon Laboratories' Si446x devices are high-performance, low-current transceivers covering the sub-GHz frequency band from 142 to 1050 MHz. The transceiver uses part of the EZRadioPRO® series, which includes a complete set of transmitters, receivers and transceivers, covering a wide range of applications. All models have excellent sensitivity of -129 dBm, while achieving extremely low main and standby current consumption. Si4463 provides frequency coverage of all major frequency bands. Si446x has the best phase noise, blocking and selectivity performance, suitable for narrowband and wireless MBus licensed frequency band applications, such as FCC Part90 and 169 MHz wireless MBus. The adjacent channel selectivity of 69 decibels and the channel spacing of 12.5kHz ensure that under harsh radio frequency conditions, this is particularly important for narrow-band operation and robust reception. Si4463 provides excellent output power up to +20 dBm and excellent transmission efficiency. High output power and sensitivity result in an industry-leading link budget of 146 decibels, allowing extended range and highly robust communication links. . These devices can meet global regulatory standards: FCC, ETSI, wireless MBus and ARIB. All devices are designed to comply with 802.15.4g and WMBus smart metering standards. These devices are very flexible and can be configured through the Wireless Development Suite (WDS) on the Silicon Labs website.

The module integrates all radio frequency related functions and devices. Users do not need to have a deep understanding of radio frequency circuit design, and can use this module to easily develop wireless solutions and wireless IoT devices with stable performance and high reliability.

Main features of the product:

- Frequency range=142-1050 MHz
- Receiving sensitivity = -129 dBm
- Modulation
- ((G)FSK, 4(G)FSK, (G)MSK
- OOK
- Maximum output power
 - +20 dBm (Si4463)
 - +16 dBm (Si4461)

- +13 dBm (Si4460)
- PA supports +27 or +30 dBm
- Low active power consumption
 - 10/13 mA receiving
 - 18 mA TX at +10 dBm (Si4460)
- Ultra-low current power-off mode
 - 6 mA average RX current 1.2 kbps
 - 10 μ average receiving current
- 50 kbps and 1 second sleep interval
 - Fast preamble detection
- 1 byte preamble detection
 - Data rate = 100 bps to 1 Mbps
 - Quick wake up and jump time
 - Power supply = 1.8 to 3.8 V
 - Excellent selective performance
- 69 dB adjacent channel
- 79 dB blocking at 1 MHz
 - Antenna diversity and T/R switch control
 - Highly configurable packet processing program
 - TX and RX 64-byte FIFO
- 129 bytes dedicated Tx or Rx
 - Automatic frequency control (AFC)

- Automatic gain control (AGC)
- Low bill of materials
- Low battery detector
- Temperature sensor
- 20-pin QFN package
- Comply with IEEE 802.15.4g and WMBus
- Applicable to FCC Part 90 Mask D, FCC Part 15.247, 15231, 15249, ARIB T-108, T-96, T-67, RCR STD-30, China Management
- ETSI Class I operation EN300 220

application:

- Logistics tracking, warehouse inspection, electronic tags, etc.
- Replace 232 and 485 for wireless data communication
- Wireless data acquisition and control of industrial instrumentation
- AMR (water, electricity, gas) three meter reading
- Control of buildings and houses (smart home)
- Wireless remote control of electronic consumer products
- Wireless alarm and security system
- Wireless sensor network

II. Technical parameter

Technical index	parameter	Remark
voltage range	1.8 ~ 3.8V	General application 3.0V/3.3V
Frequency Range	433MHz、868MHz、915MHz	Applicable frequency band is determined by hardware
Output Power	-20 ~ 20dBm	
Wireless rate	0.1kbps ~ 500Kbps@FSK	Programmable configuration
Modulation	FSK、OOK	
Receiving sensitivity	-129dBm@500 bps, GFSK, BT = 0.5	
Receive bandwidth	1.1kHz ~ 850kHz@FSK	Programmable configuration
Emission current	88mA	Transmit power = 20dBm
Receive current	13.7mA	
Sleep current	<1uA	
Drive interface	SPI	Standard 4-wire SPI, SPI clock: ≤10MHz CPOL = 0, CPHA = 0
Antenna impedance	50 欧姆	
Antenna connection method	Side stamp hole	
Operating temperature	-40°C ~ 85°C	
Size	11.5 x 10.0mm	

I .Pin location map

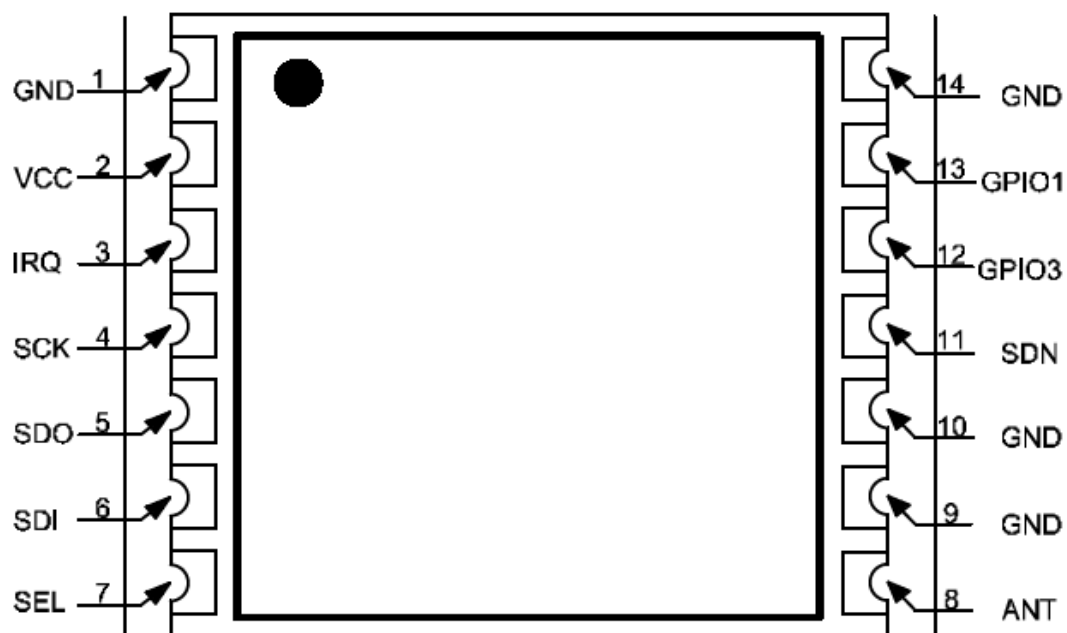


Figure 1-1 Top view

IV.Pin description

Num	Pin	Types	Describe
1	GND	power supply	Power supply-negative
2	VCC	power supply	Power supply-positive
3	IRQ	O	NIRQ interrupt output signal, output low level when interrupt is generated
4	SCK	I	SPI interface SCLK clock input
5	SDO	I/O	SPI interface MISO data output
6	SDI	I/O	SPI interface MOSI data input
7	SEL	I/O	SPI interface NSEL selection input
8	ANT	I/O	RF signal input/output, connected to a 50Ω antenna
9	GND	power supply	Power supply-negative
10	GND	power supply	Power supply-negative
11	SDN	I	Shutdown control pin. SDN=0, this pin must be set low in all modes except shutdown mode SDN=1, the module will be shut down completely and the contents of internal registers will be lost
12	GPIO3	I/O	Directly connected to the chip GPIO3 digital I/O pin, software configurable function
13	GPIO1	I/O	Directly connected to the chip GPIO1 digital I/O pin, software configurable function
14	GND	power supply	Power supply-negative

V. Hardware connection diagram

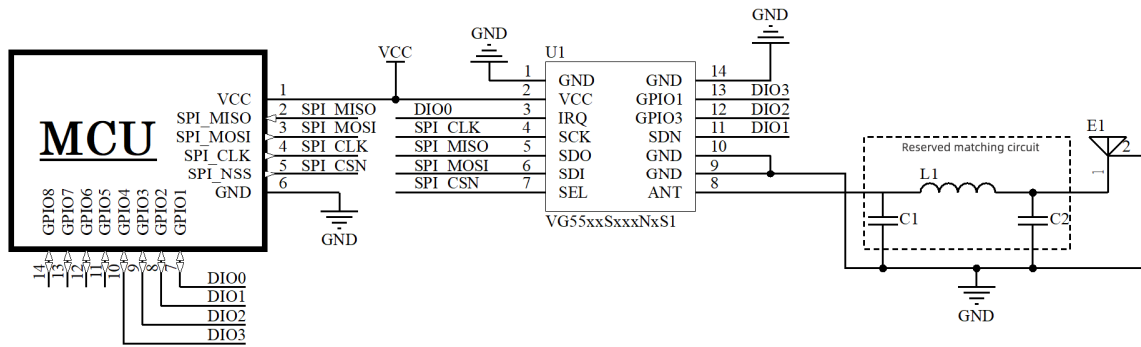
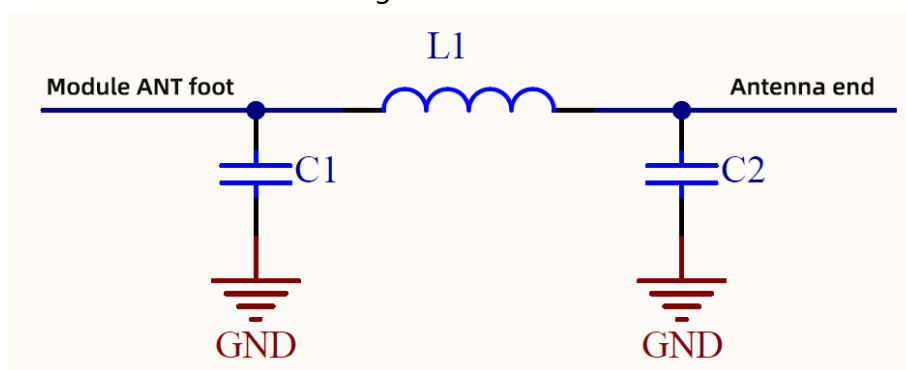


Figure 5-1 Programming development hardware connection

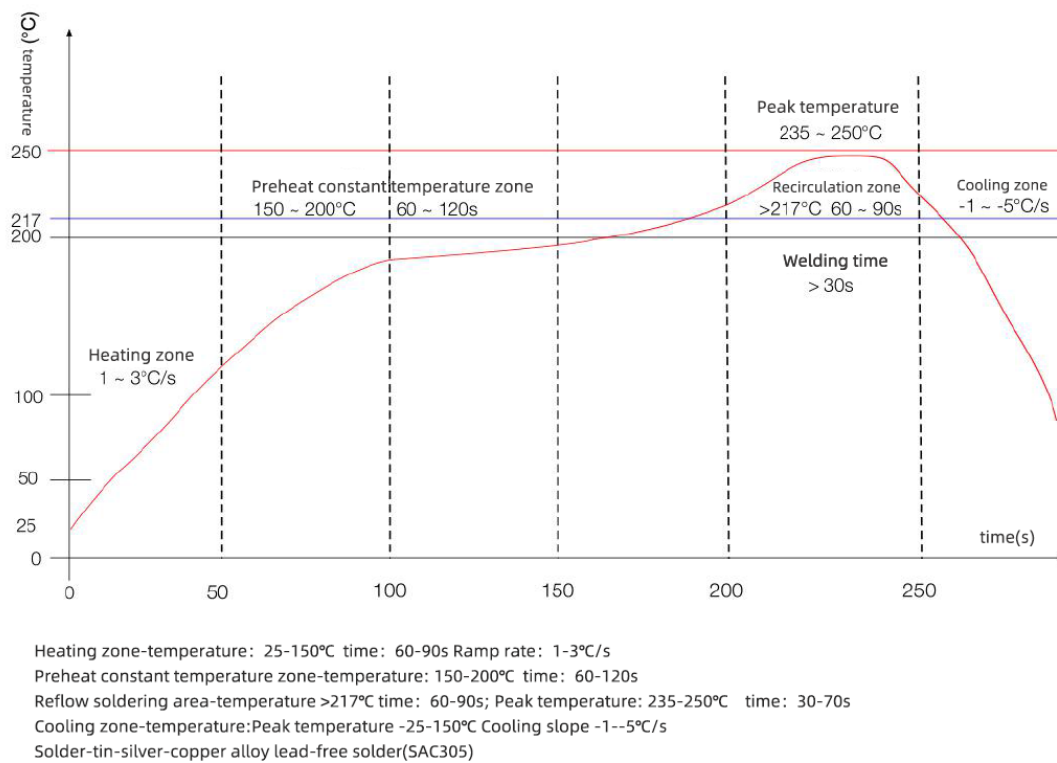
VI. Antenna matching

The antenna is very important to the transmission distance of the radio frequency module. In practical applications, it is convenient for users to adjust the antenna matching later. It is recommended that users reserve a simple π -type matching circuit between the antenna and the ANT pin output of the module when designing the schematic diagram. If the antenna is already a standard 50Ω , the component L1 is attached with $0R$ resistance, and the components C1 and C2 do not need to be soldered. Otherwise, a network analyzer needs to be used to measure the actual impedance of the antenna and match to determine the value of C1, L1, and C2. The trace from the ANT pin of the module to the antenna end should be as short as possible. It is recommended that the trace width be at least 0.5MM and the length should not exceed 30MM.



6-1 π -type matching circuit

VII. Reflow soldering curve



VIII. Electrostatic damage warning

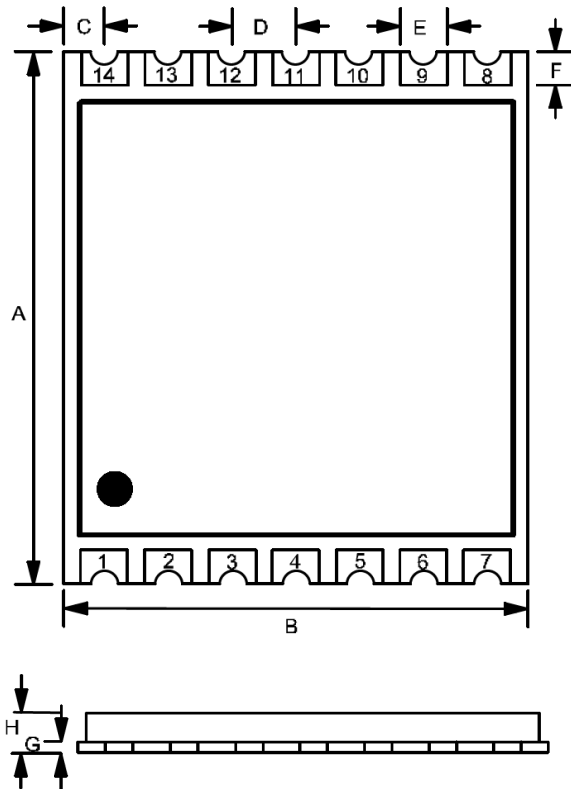
The radio frequency module is a high-voltage electrostatic sensitive device, in order to prevent static electricity from damaging the module

1. Strictly follow anti-static measures, and it is forbidden to touch the module with bare hands during the production process.
2. The module should be placed in a place where static electricity can be prevented.
3. The anti-static protection circuit at the high voltage input should be considered when designing the product.



IX.Package information

IX. I Mechanical Dimensions(unit:mm)



number	size(mm)
A	11.5
B	10
C	0.88
D	1.37
E	1.0
F	0.65
G	0.8
H	2.2

Tolerance: $\pm 0.1\text{mm}$

X.Version update instructions

Version	Update content	Updated	Principal
V01	First release	January 6, 2020	DropLin

XI.Procurement Selection Table

Num	Model	Instruction
1	VG5574S433N0S1-B\D	433MHz frequency band, version: B, taping packaging\independent packaging
2	VG5574S433N2S1-B\D	433MHz frequency band, version: C, taping packaging\independent packaging
3	VG5574S868N0S1-B\D	868MHz frequency band, version: B, taping packaging\independent packaging
4	VG5574S868N2S1-B\D	868MHz frequency band, version: C, taping packaging\independent packaging
5	VG5574S915N0S1-B\D	915MHz frequency band, version: B, taping packaging\independent packaging
6	VG5574S915N2S1-B\D	915MHz frequency band, version: C, taping packaging\independent packaging

XII.Statement

1. Due to product version upgrades or other reasons, the content of this document will be updated from time to time. Unless otherwise agreed, this document is only used as a guide, this article
All statements, information and suggestions in the do not constitute any express or implied guarantee.
2. The company reserves the right of final interpretation and modification of all the materials provided, and subject to change without notice.

XIII.Contact us

Company: Shenzhen vollgo Technology Co., Ltd.

Address: 205-208, Building C, Wisdom Cloud Valley, No. 1, Sanhe Road,
Gaofeng Community, Dalang Street, Longhua District, Shenzhen

Phone: 0755-23040053

Fax: 0755-21031236

Official website: www.vollgo.com

Business cooperation: sales@vollgo.com

