VG2300SXS -X2 wireless module

Instructions for use

(Subject to the actual product/can be customized)

Model selection table

serial number	Product number	Center frequency	Antenna form	size	Remark
1	VG 2300S4S-X1	433MHZ _	Need outsourcing	16×13×2 mm	
2	VG 2300S8S-X1	868MHZ _	Need outsourcing	16×13× 2mm	
3	VG 2300S9S-X1	915MHZ _	Need outsourcing	16×13×2 mm	

1. product description

VG2300SXS The series wireless transceiver module is an ultra-small size, low power consumption, high performance, suitable for various 140 to 1020MHz for wireless applications OOK, (G)FSK RF transceiver. Up to +20 dBm and -12 1 dBm sensitivity optimizes link performance for applications. It supports a variety of data packet formats and codecs, making it flexible to meet the needs of various applications for different data packet formats and codecs. in addition VG2300SX also supports 64-b yte Tx/Rx FIFO, rich GPIO and interrupt configuration, Duty-Cycle operating mode, channel listening, high accuracy RSSI, low voltage detection, power-on reset, low-frequency clock output, manual fast frequency hopping, squelch output Functions such as this make application design more flexible and enable product differentiation design. VG2300SXS Work on 1.8 V to 3.6V. When reaching -121 dBm When the sensitivity only consume 8.5 mA Current, ultra-low power reception mode can further reduce the chip' s reception power consumption; to 13dBm output is consumed only 2 3 mA emission current.

2. Basic Features

- ●Working voltage: 1.8～3.6V
- ●Emission current: 23 mA @ 13 dBm, 433.92 MHz FSK, 72mA @ 20 d Bm, 433.92MHz FSK
- ●Receive current: 8.5 mA @ 433.92 MHz
- ●Support ultra-low power consumption receiving mode
- ●Sleep current
  - 300nA, DutyCycle = O F
  - 800nA, DutyCycle = ON
- ●3-wire SPI interface
- ●Supports pass-through and packet modes
- ●Configurable packet processor and 64-byte FIFO
- ●Non-return to zero, Manchester, data whitening codec
- ●Support forward error correction
- ●Conform to FCC Part 90 Mask D, FCC part 15.247, 15, 231, 15, 249, ARIB T-1 08, T-96, T-67, RCR STD-30, China Supervision Specifications of the tube mechanism
- ●Ultra-small size design 16×13×2mm

3. Application scope

- ●Logistics tracking, warehouse inspection, electronic labels, etc.
- ● Wireless data collection and control of industrial instruments
- ● AMR (water, electricity, gas) three meter reading
- ● Home security and building automation
- ● Wireless remote control for consumer electronics products
- ●Wireless alarm and security system
- ● Wireless sensor network

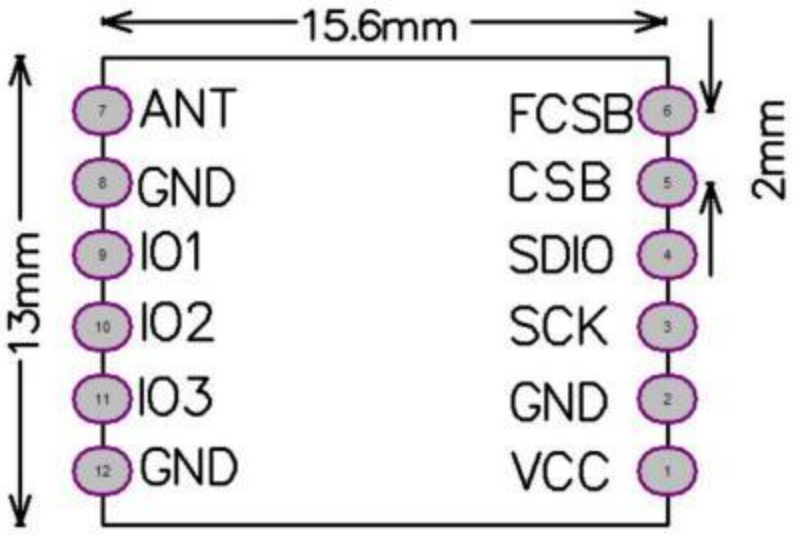
4. Technical Parameters

Test conditions: Ta=25° C, VCC=3.3V

Technical indicators	parameter	Remark
Operating Voltage	DC 1.8～3.6V	
frequency Band	433\868\915MHZ	Corresponding to each model
frequency error	±10ppm	
Modulation	OK, (G)FSK FSK,	Programmable configuration
Output Power	-10～+20dBm	Programmable configuration
Receive sensitivity	-121dBm	2.0Kbps/FSK / 433.92MHz
receive current	8.5 mA	@ 433.92 MHz, FSK
Emission current	72mA	@20 dBm, 433.92 MHz FSK
stand-by current	<300nA <0.3uA	Deep sleep current Reference chip specification sheet
Transmission rate	0.5～300 Kbps	Programmable configuration
Communication distance	>1000 rice	2.4Kbps
Antenna impedance	50ohm	
Operating temperature	-40～+85 ° C	
storage temperature	-50～+150° C	
Dimensions	16×13×2mm	Please refer to the overall dimensions drawing for pins and detailed dimensions.

5. Dimensions and pin definitions

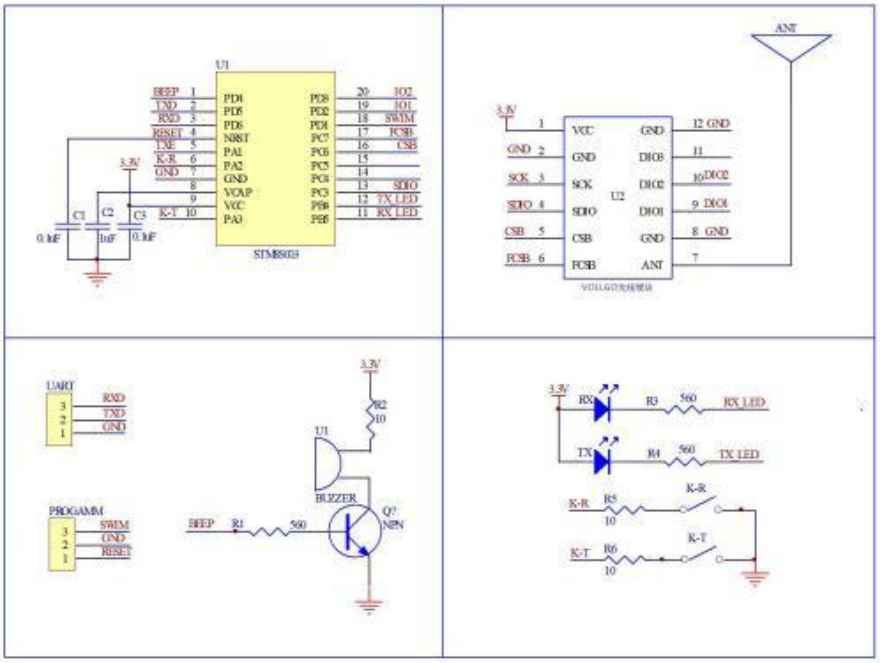
Unit: mm (±5%)



serial number	name	type	Function
1	VCC	-	Positive power supply 1.8~3.6V
2	GND	-	Negative ground of power supply
3	SCK	I/O	SPI clock
4	SDIO	I/O	SPI data input and output
5	CSB	O	SPI access register chip select
6	FCSB	I	SPI access FIFO 's film selection
7	ANT	O	Signal input/output, connected to 50Ω antenna
8	GND	I	Negative ground of power supply
9	IO1	I	Configurable as: INT1, INT2, DOUT/DIN, DCLK (TX/RX), RF_SWT
10	IO2	I/O	Can be configured as: DOUT/DIN, INT1, INT2, DCLK (TX/RX), RF_SWT
11	IO3	I/O	Configurable as: CLKO, DOUT/DIN, INT2, DCLK (TX/RX)
12	GND	I	Negative ground of power supply

6. Design guidance and precautions

6.1 Circuit diagram reference



6.2 Power supply design

In a 3.3V power supply system, excessive ripple may be coupled through wires or ground planes to lines in the system that are susceptible to interference, such as antennas, feeders, Sensitive signal lines such as clock lines can easily cause the module's radio frequency performance to deteriorate, so we recommend using LDO as the power supply for the wireless module. When customers use LDO, they need to pay attention to the heat dissipation and output current of the power supply. For example, the commonly used 5V to 3.3V converter has a voltage drop of 1.7 V. Assuming the output current Under 100mA, then The power lost by the power chip.

The module should be kept away from high-voltage electrical appliances as much as possible, because the electromagnetic waves from high-voltage electrical appliances will also have a certain impact on radio frequency signals .

Please use one separately for the module LDO Voltage stabilizing chip, if a switching power supply chip is used, one must be added at the end LDO to prevent noise from switching power supply chips Interference RF, LDO The maximum current is greater than 300mA.

Customers have special needs in different applications and occasions. They can choose the device according to the common parameters of LDO. They only need to ensure the above conditions.

6.3 Antenna design and guidance

6.3.1 stamp hole interface RF design

When the customer chooses our module's RF output interface to be in the form of a stamp hole, use 50ohm characteristic impedance traces to connect to the user's PCB board during design. The traces should be as short and straight as possible. Do not use sharp or right angles when turning. Arc lines can be taken, and the radius of the arc should not be less than 3 times the line width.

6.3.2 Patch antenna design

When using a patch antenna, the circuit board under the module antenna must not be paved with copper, or the circuit board under the module should be hollowed out, because metal has a strong ability to absorb and shield radio frequency signals, which will seriously affect the communication distance. Place the module as much as possible At the edge of the base plate, if space permits, the antenna part should preferably be outside the base plate.6.3.3 External antenna design.

6.3.3 External antenna design

When customers choose our company's modules to connect external antennas through IPEX, SMA and other radio frequency interfaces, they should choose an antenna suitable for the module. During the antenna selection process, the parameters of the antenna should be selected and applied. The following should be noted:

●The working frequency of the antenna and the working frequency of this module should be consistent;

●The size of the antenna interface should match the size of the antenna interface of the module;

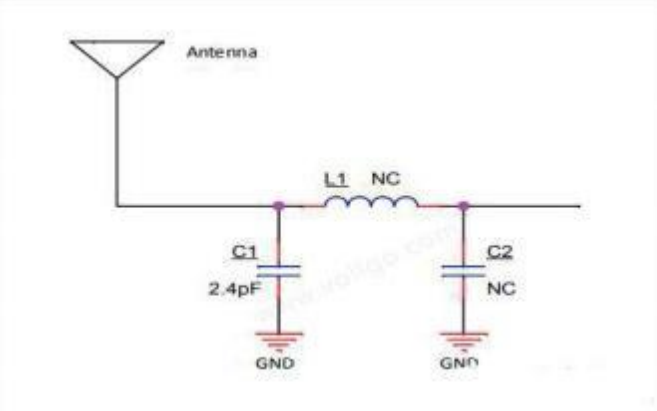
●The voltage standing wave ratio (VSWR) of the antenna is recommended to be less than 2, and the antenna should have a suitable frequency bandwidth;

●The input impedance of the antenna should be 50 ohm;

●When the antenna is placed inside the product, you should consult us and the relevant antenna design manufacturer.

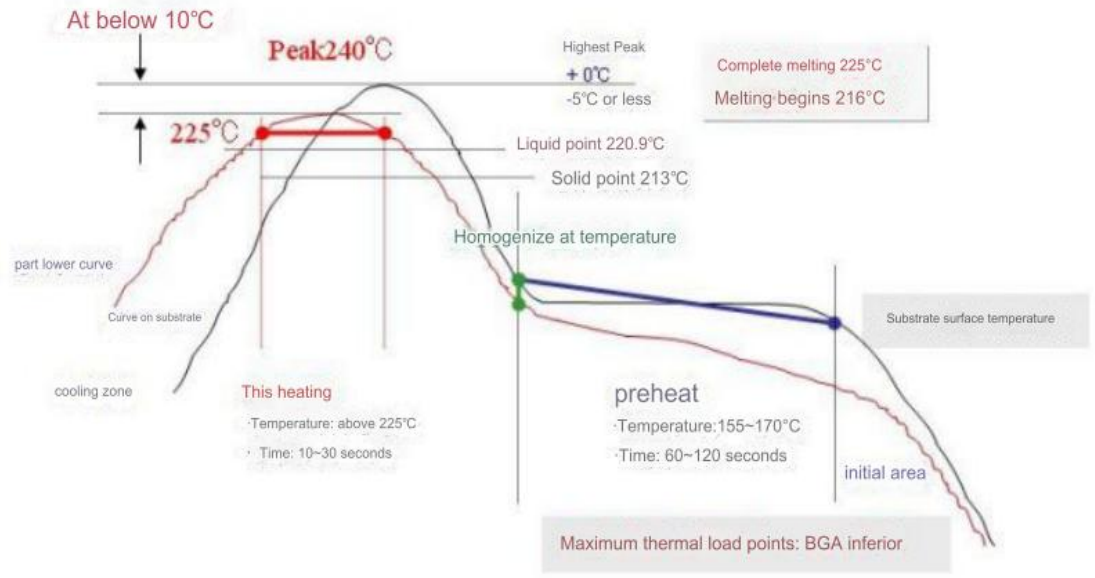
6.3.4 The world matches

the π-type matching network shown in the figure below when designing the schematic diagram . Generally, if the antenna is already 50Ω, capacitor L1 selects 270pF capacitor (it is Equivalent to a short circuit device on 433~470Mhz ,) C2 and C3 do not need to be welded . If the antennas do not match, you need to use a network analyzer to measure the impedance and then determine L1, C2 , C3 value. module The wiring path from the ANT pin to the antenna terminal should be as short as possible. The recommended wiring width is 2~3mm, the length does not exceed 30mm. From past experience, in The impact of trace impedance mismatch in the 433~470Mhz frequency band is not great, but the insertion loss caused by small trace width is often more serious. C1 selection is recommended muRata communication RF series application series.



7. Production guidance

During the reflow soldering process of the product, it is recommended to follow the reflow soldering temperature curve recommended in the following chart and the solder paste manufacturer 's guidelines.



The above chart is for reference only

8. Disclaimer:

In line with the principle of providing better services to users, Shenzhen Wojin Technology Co., Ltd. (hereinafter referred to as "Wojin Technology") will try its best to provide users with the best service in this manual. Present detailed and accurate product information. However, since the content of this manual has a certain timeliness, Wojin Technology cannot fully guarantee the timeliness of this document at any time. sex and applicability. The copyright of Wojin Technology reserves the right of final interpretation and modification, and the right to update the contents of this manual without notice. Notice. In order to obtain the latest version of information, respected users please visit the official website of Wojin Technology regularly or contact Wojin Technology staff. thank you for the package Tolerance and support!

9.Document change record

Version	date	reason
V1.00	2016/04/16	Create document
V2.00	2019/04/16	Style changes

10.Contact information

Shenzhen Wojin Technology Co., Ltd.

Smart Cloud Valley, No. 1, Sanhe Road, Dalang Street, Longhua District, Shenzhen City, Guangdong Province, China A306

Sales Support: sales@vollgo.com

Technical support: rf@vollgo.com

Website: www.vollgo.com

Tel: +86 -755 -23040053

Fax: +86 -755- 21031236

Postal code: 518000