

VG6244S580X0M1- IPEX wireless module

Hardware specification

V1.0



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1. Overview

VG6244S580X0M1-IPEX Wireless module is a module based on A5133. The wireless transceiver chip is designed with small size and high transmission rate. 5.8GHz frequency band Two-way wireless transceiver module. The module integrates PA+LNA amplifier, with maximum power up to 25dBm, which greatly improves the transmission distance of the module.

A5133 is a chip working at 5.8GHz frequency band FSK Wireless RF transceiver chip, supports independent 64bytes TX/RX FIFO with up to 4Mbps. The data transfer rate is particularly suitable for IoT usage scenarios with low latency and large data volume transmission. To ensure the security of data transmission A5133 Already integrated AES128 Encryption and decryption engine.

The module integrates all radio frequency related functions and devices. Users can use this module to easily develop products without having an in-depth understanding of radio frequency circuit design. Wireless solutions and wireless IoT devices with stable performance and high reliability.

Product main features:

- 5.8GHz Wireless transmission frequency band
- generation IPEX external antenna
- 3 Line/4 Wire SPI interface
- Programmable data transfer rate: 4Mbps/2Mbps /500Kbps
- Sleep current: 4uA
- Maximum transmit power: 25dBm
- Receiving sensitivity: -98dBm @4Mbps

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- built-in AES128 encryption engine

 - Working voltage: 4.5-5.2V

application:

1. HiFi wireless audio

2. Video and picture transmission

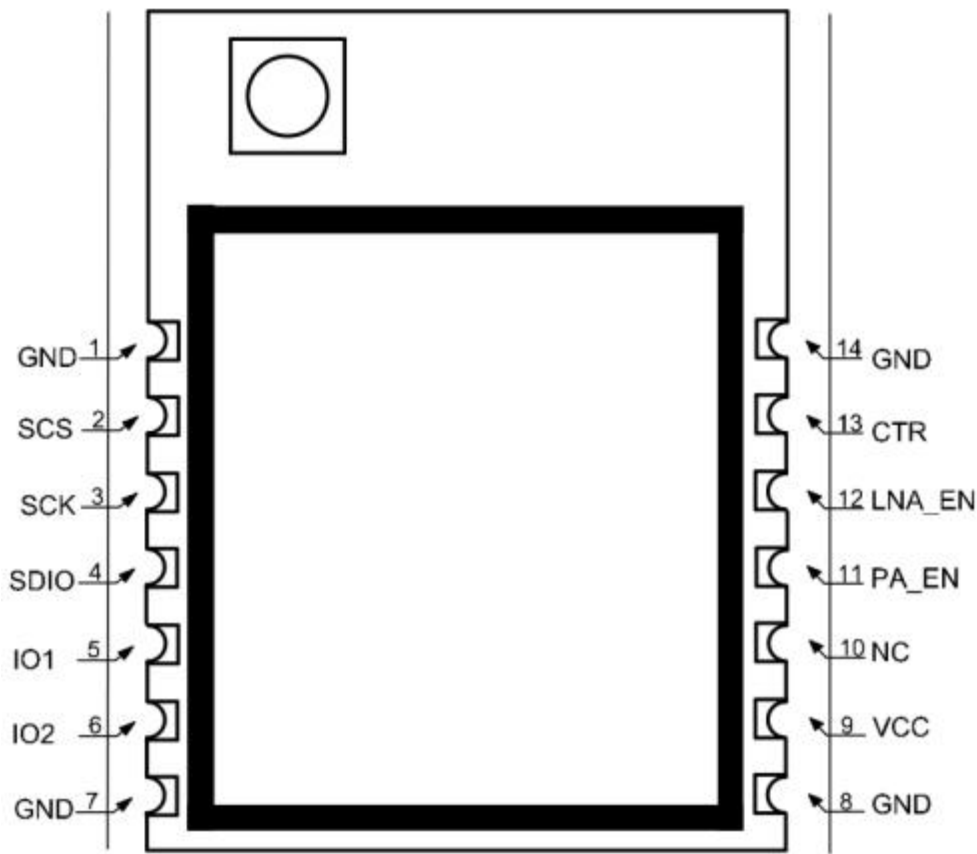
3. Toys and game controllers

4. Digital intercom

2.The main technical parameters

Technical indicators	parameter	Remark
voltage range	4.5 ~ 5.2V	generally 5V
Working frequency	5.8 GHz	5725MHz - 5850MHz _
Output Power	25dBm _	A5133TX _ Power =0 dBm , after PA Output after amplification + 25dBm power
Wireless speed	500Kbps / 2Mbps / 4Mbps _	Programmable configuration
Modulation	FSK	
Receive sensitivity	-98 dBm	@4 Mbps
Emission current	450mA _	Transmit power= 25dBm _
receive current	40 mA	@4 Mbps
Sleep current	10uA	
Driver interface	SPI	3Wire or 4Wire SPI
Antenna impedance	50 ohm	
antenna	Onboard PCB antenna	
storage temperature	-55°C ~ +125°C	
Operating temperature	-40°C ~ +85°C	Industrial grade
Size	16.8x 21.5x2.4mm	L*W*H

3. Pin location diagram



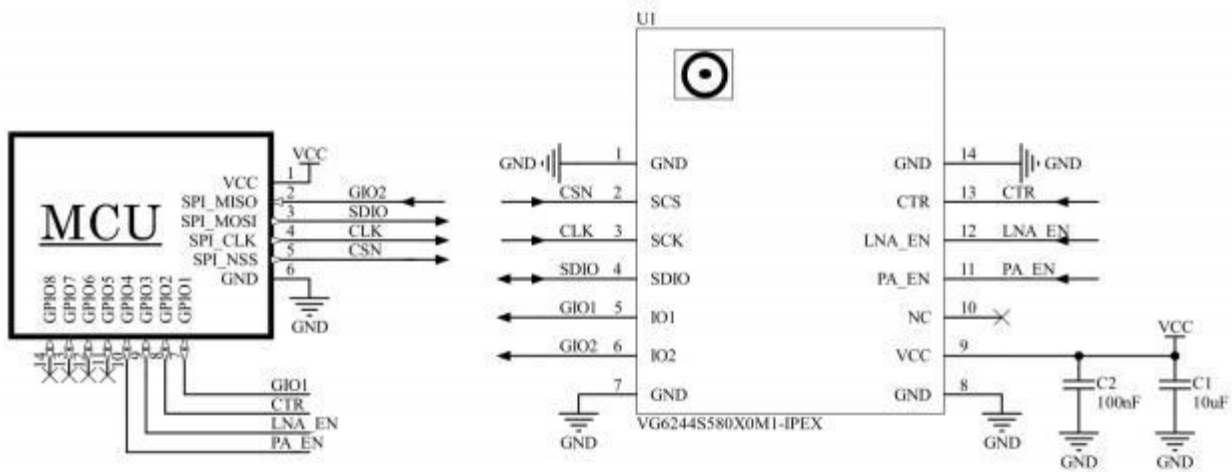
picture 3-1 top view

4. Pin description

number	pin	type	describe
1	GND	land	power ground
2	SCS	SPI Chip Select	SPI interface SPI Chip Select
3	SCK	SPI clock	SPI Interface clock input
4	SDIO	SPI data	SPI Data input and output
5	IO1	I/O	Programmable function configuration (generally used to indicate the completion of sending and receiving data packets, see the chip manual for details)
6	IO2	I/O	Function programmable configuration (see chip manual for details)
7	GND	land	power ground
8	GND	land	power ground
9	VCC	power supply	Module power supply, general 5V enter
10	GND	land	power ground
11	PA_EN _ _	I	module PA Enable pin, in transmit mode: PA _ EN =1, LNA _ EN =0, CTR =0
12	LNA_EN _ _	I	module LNA Enable pin, in receive mode: PA _ EN =0, LNA _ EN =1, CTR =1
13	CTR	I	Module receiving control pin, in receiving mode CTR 1
14	GND	land	power ground

5. Hardware design guidance and considerations

5.1. Hardware connection diagram



picture 5-1 Programming Development Hardware Connection

5.2. Power supply design and related precautions

1. Please pay attention to the correct connection of the positive and negative poles of the power supply, and ensure that the power supply voltage is within the recommended supply voltage range. If it exceeds the maximum allowable power supply range of the module , it will cause Otherwise the module will be permanently damaged; the filter capacitor of the module power pin should be as close as possible to the module power pin.
2. In the module power supply system, excessive ripples may be coupled to lines susceptible to interference through wires or ground planes, such as antennas, feeders, and clocks.lines and other sensitive signal lines, It is easy to cause the RF performance of the module to deteriorate, so we recommend using LDO as the power supply for the wireless module.

3. Select LDO When installing a voltage stabilizing chip, you need to pay attention to the heat dissipation of the power supply and LDO Stable output current driving capability; considering the long-term stable operation of the whole machine, it is recommended Recommended reservation More than 50% current output margin.
4. It is best to use a linear regulated power supply to power the module alone; if DC-DC power chip, you can consider adding a linear regulated power supply later. It is used to isolate the module power supply and prevent the noise of the switching power supply chip from interfering with the working performance of the radio frequency.
5. MCU If the communication line between the module and the module is used 5V level, must be connected in series 1K-5.1K Resistor (not recommended, still risk of damage).
6. Keep the RF module as far away from high-voltage devices as possible, because the electromagnetic waves of high-voltage devices will also have a certain impact on RF signals.
7. High-frequency digital traces, high-frequency analog traces, and high-current power traces should be kept away from the bottom of the module as much as possible. If they must pass under the module, the traces must be routed. Put the module PCB Another layer of the bottom board, and ensure that the copper underneath the module is well grounded.

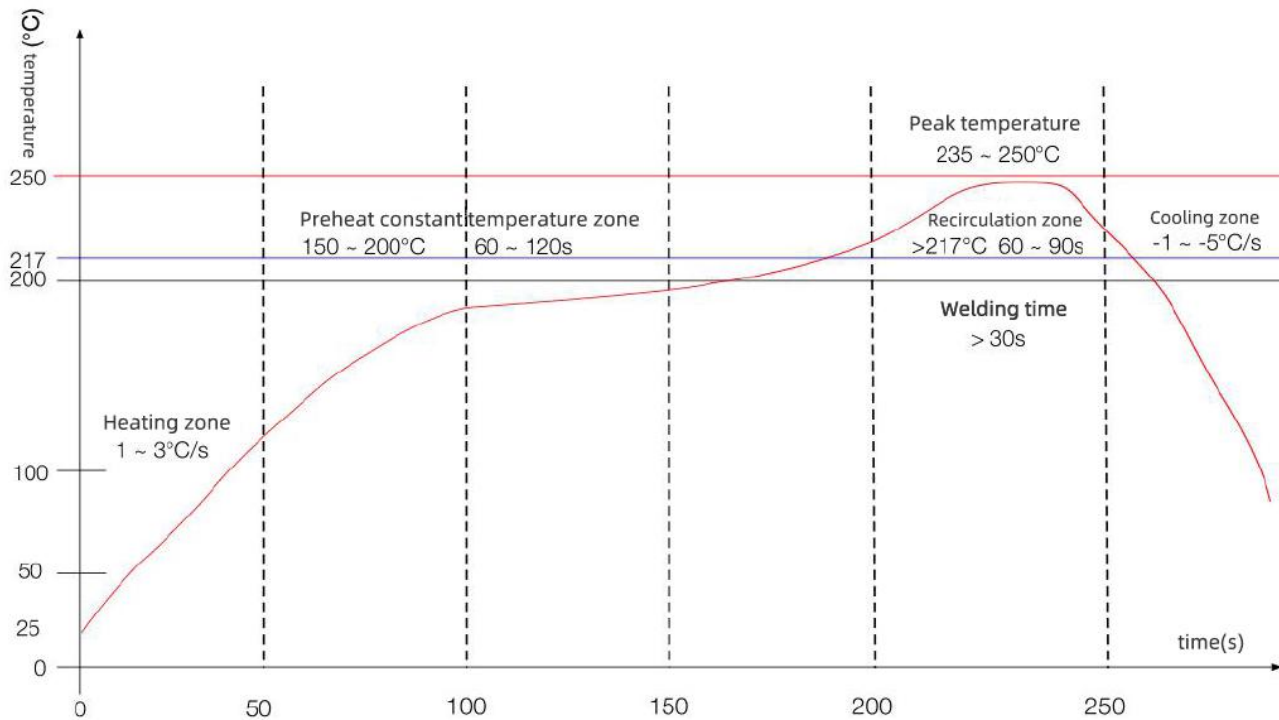
6. Precautions for programming development

This module has an external power amplifier (PA) and low noise amplifier (LNA) inside. Please note that when setting the A5133 chip transmit power, the maximum cannot exceed 5dBm, otherwise Then there is a risk that the amplifier inside the module will burn out. Generally, the A5133 transmit power is set to 0dBm.

The module PA_EN, LNA_EN, and CTR pins are the logic control pins of the PA&LNA devices inside the module. Please pay attention to their control levels when using them. The control logic is listed below:

model	PA_EN	LNA_EN	CTR
emission	1	0	0
take over	0	1	1
hibernate	0	0	0

7. Reflow soldering curve



Heating zone-temperature: 25-150°C time: 60-90s Ramp rate: 1-3°C/s
 Preheat constant temperature zone-temperature: 150-200°C time: 60-120s
 Reflow soldering area-temperature: >217°C time: 60-90s; Peak temperature: 235-250°C time: 30-70s
 Cooling zone-temperature: Peak temperature -25-150°C Cooling slope -1--5°C/s
 Solder-tin-silver-copper alloy lead-free solder(SAC305)

8. Static electricity damage warning

The RF module is a high-voltage electrostatic sensitive device. In order to prevent static electricity from damaging the module

1, Anti-static measures are strictly followed, and bare hands are prohibited from touching the module during the production process .

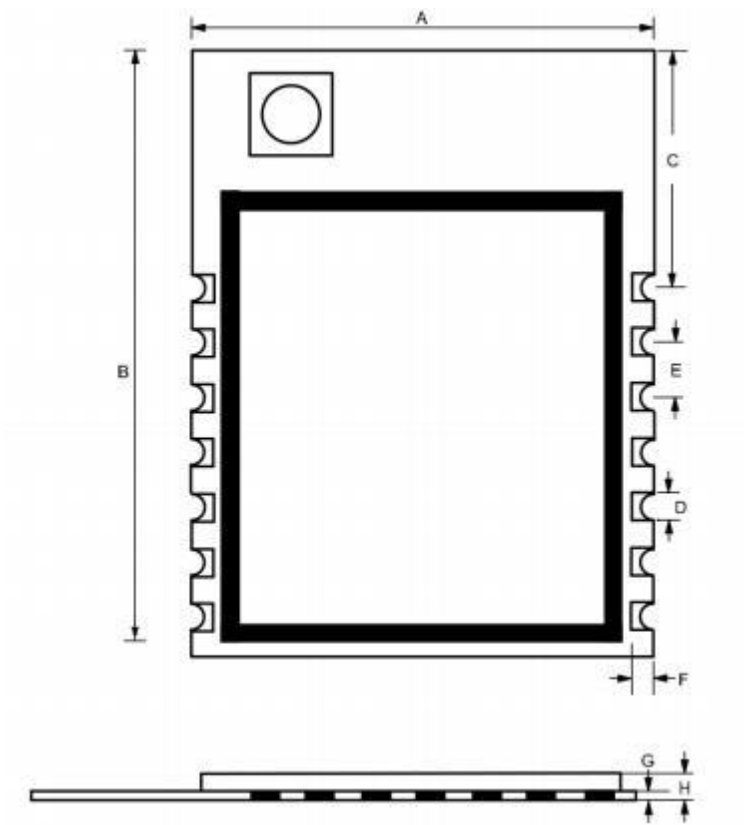
2, Modules should be placed in a placement area that prevents static electricity.

3. The anti-static protection circuit at the high-voltage input should be considered during product design.



9. Packaging information

Mechanical dimensions (unit: mm)



serial number	Dimensions (mm)	Error (mm)
A	16.7	±0.5
B	22.0	±0.5
C	8.6	±0.1
D	1.0	±0.1
E	2.0	±0.1
F	0.7	±0.1
G	0.8	±0.1
H	2.4	±0.2

10. Version update instructions

Version	update content	Updated
V1.0	initial version	2023 Year 4 moon 23rd

11. Procurement selection table

number	model	illustrate
1	VG6244S580X0M1-IPEX	generation IPEX Antenna\tape packaging\pallet packaging

12. 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.

All statements, information and

recommendations in do not constitute any express or implied warranty.

2. The company reserves the right of final interpretation and modification of all information provided, and any changes will be made without prior notice.

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