

Embedded Radio Data Transceiver SV611

Description

SV611 is highly integrated, multi-ports radio data transceiver module. It adopts high performance Silicon Lab Si4432 RF chip. Si4432 has low reception sensitivity and 100mW output power to ensure longer RF range and high link quality. SV611 supports multiple channels and Net ID to enhance the anti-interfere ability. Users can configure the parameters through PC or in circuit. The features of small packet, long distance, wide working voltage and setting in circuit make SV611 widely deployed in many fields and applications.



Feature

- 1400m RF line-in-sight distance@1.2kbps
- 433/470/868/915 MHz
- 40 channels
- 4 bytes net ID
- 2 bytes node ID
- Multiple air data rate
- GFSK modulation
- antenna match automatically and bi-direction switch control
- Support Serial port parameter setting
- Sensitivity: -121 dBm
- Max output power: 100 mW
- Voltage: 2.8 ~ 6.0 V
- Temperature: -40 ~ +85 °C

Application

- Remote telemetry
- Auto meter reading
- Security systems
- Data logger
- Wireless data communication
- Building residential automation and security
- Healthy monitoring
- Wireless PC peripherals
- Access Control System
- Robot control

Electrical Specifications

Parameter	Min.	Typ.	Max.	Unit	Conditions
Operation conditions					
Supply Voltage	2.8	5.0	6.0	V	TTL level
	4.5	5.0	5.5	V	232/485 level
Operating Temperature	-40	25	+85	°C	
Current consumption					
RX Current		25		mA	TTL level
		34		mA	485 level
		32.7		mA	232 level
TX current		95		mA	@20dBm
Sleep Current		<5		uA	@TTL level
RF parameters					
Frequency	414.92	433.92	453.92	MHZ	@433MHZ
	470.92	470.92	509.92	MHZ	@470MHZ
	849.92	868.92	888.92	MHZ	@868MHZ
	895.92	914.92	934.92	MHZ	@915MHZ
Air data rate	1.2	9.6	38.4	Kbps	GFSK
Output power	-1	/	+20	dBm	Setting by software
Sensitivity		-121		dBm	@1.2kbps

Technical specification

5.1, Parameter configuration

In configuration mode, users can set the parameters by PC tool or in circuit through UART port. The parameters include channels, frequency, air data rate, out put power, serial port baud rate, data bit, stop bit, parity bit, NET ID and NODE ID. The detailed communication protocol is shown in the programming manual.

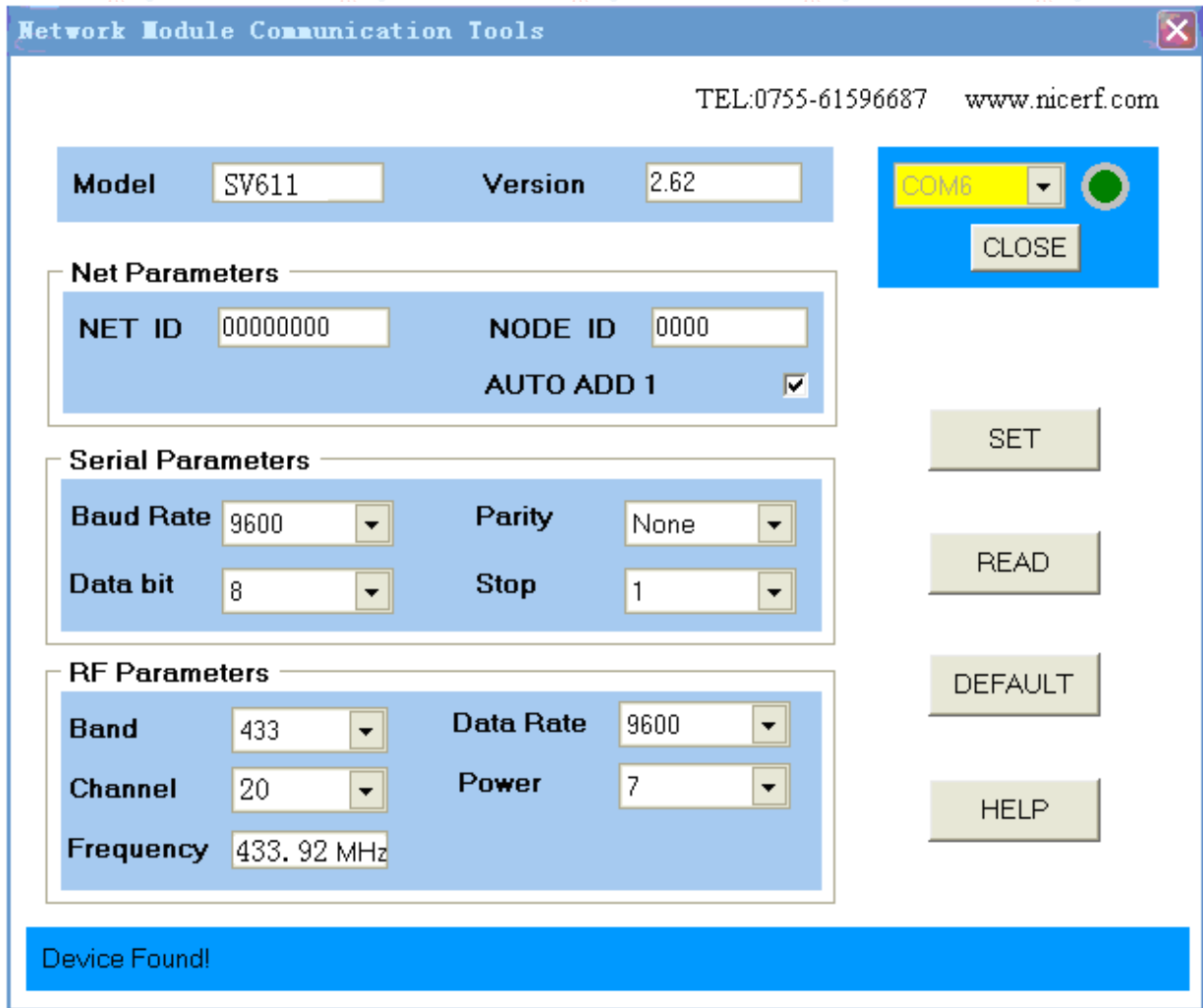


Figure 1: Interface of setting tool

Parameter	Length (byte)	Explanation
Frequency	1	433MHz / 470MHz / 868MHz / 915MHz
Channel	1	1 ~ 40
Air data rate	1	1200/2400/4800/9600/14400/19200/38400 bps
Output power level	1	0~7 level
UART baud rate	1	1200/2400/4800/9600/14400/19200/38400 bps
UART Data bit	1	7, 8, 9
UART stop bit	1	1, 2
UART parity	1	No、Odd、 Even

Table 1: Parameter specification

5.2, RSSI function (Optional)

Module has two versions. If users choose the version with RSSI function, the instruction will retrieve the module and receive a data packet of RSSI value in configuration mode.

5.3, Data transmitting

When module is in transmitting mode, data from serial port can be sent via RF chip modulation into the air toward targeted module of the link layer forwarding. When the targeted module receives the RF data from the source, it also converts it into a serial signal and output to the device of the target.

In order to ensure the stability and correctness of the data transmitting, user should pay attention to the following issues:

1) RX/TX Match

In the same network, in order to ensure available of communication, all modules must be in same condition. That means all the parameters such as frequency, channel, net ID are same. The module has a 4-byte network ID. It can not communicate with each other between the different network ID configuration modules. When the network ID is set to all 0, this module can receive any data information.

2) Latency

Since the wireless communication transmitting device receives from the terminal end of a certain amount of data, or wait a certain time before the new data does not start transmitting, the radio communication transmitting end to the receiving end there is a wireless communication delay, the other from the wireless communication terminal apparatus receiving end it will take some time, but the delay time under the same conditions is fixed (specific time is determined by serial rate, air rate determined by the size).

3) Data traffic

Inside the module has a 200-byte buffer, when the serial data rate less than or equal wireless transmission rate can be guaranteed data transfer smoothly, but if the serial port rate is greater than the wireless transmission rate, continuously sending data bytes exceeds the buffer size may data overflow occurs as a result of data loss. Therefore, large amounts of data for continuous transmission, to avoid data loss or errors, you can set the parameters so that the serial transmission rate does not exceed the wireless transmission rate.

5.4, Sleep mode

When CS pin is set to low, module is in sleep mode. User can't do any operation for the module.

The power consumption is low to 5uA.

Accessories

1) Antenna

The antenna is an important part of the communication system. Its feature directly affects the performance of the communication system. The match impedance of module is 50 ohms, we recommend that users adopt standard spring antenna.

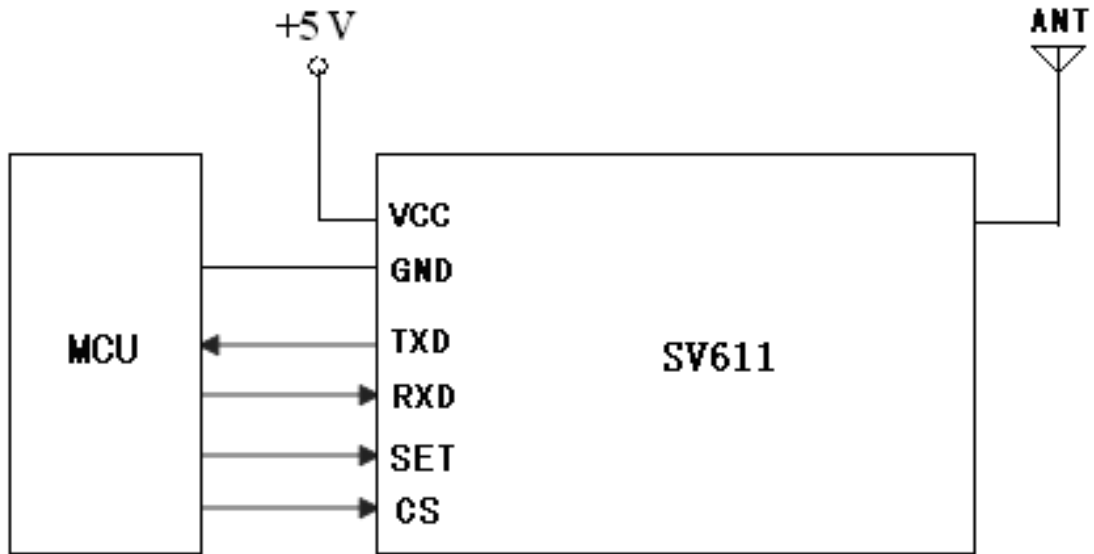


2) USB Bridge Board

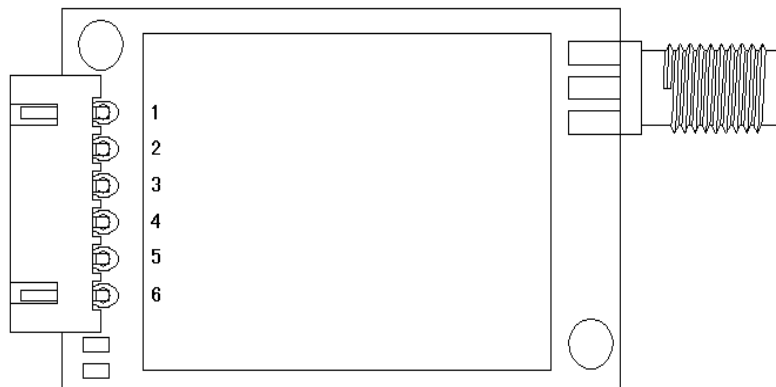
Modules needed by configuration tool to configure the relative parameters. The Company supplies a USB interface matching plate adapter with TTL/RS232/RS485 level, so that users can quickly and easily with the PC side communication.



Schematic



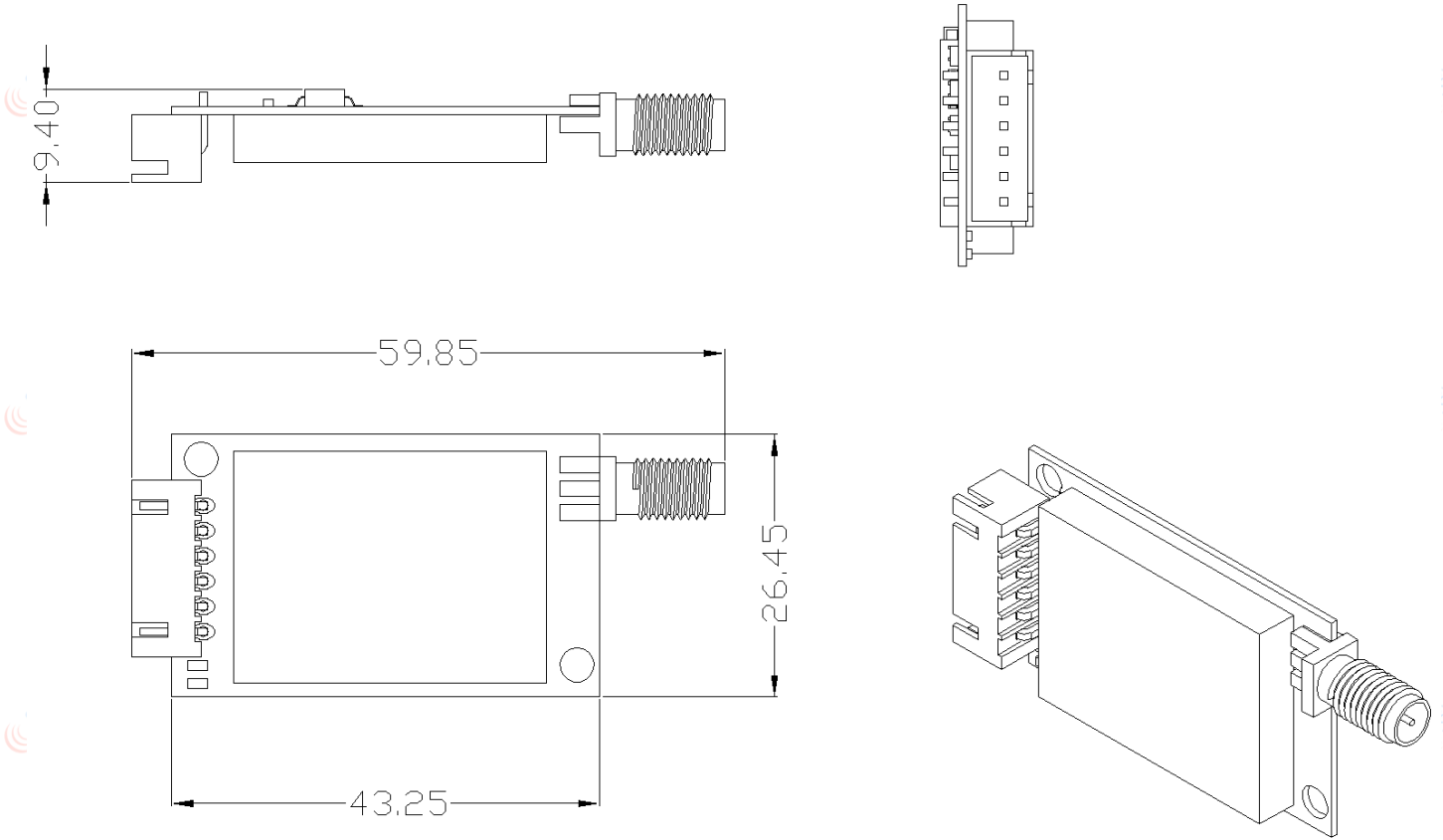
Pinouts



Pin No.	Definition	Description
1	VCC	Connected to the positive power supply (typical 5V)
2	GND	Connected to ground
3	TXD	Data transmitting
4	RXD	Data receiving
5	SET	Configuration parameters enable (low to enable the configuration parameters, the default high-level output)

6	CS	Enable (Low level sleep, the current is less than 5uA,High level default)
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Mechanical dimensions



Product Ordering Information

SV611-433

Module Model

Frequency

For example: If the customer needs 433MHZ band module that orders Model: SV611-433

The SV611 product following models:

Order a single Model	Product type
SV611-433	433MHZ, Chip module
SV611-470	470MHZ, Chip module
SV611-868	868MHZ, Chip module

SV611- 915

915MHZ, Chip module

Relative Q&A

- a) Why module can not communicate properly?
- 1) Check the band, channel, rate, NET ID is set to the same;
 - 2) The power connection error, the module is not working;
 - 3) Module is enabled (CS high);
 - 4) The antenna connection is not correct;
 - 5) Module is damaged.
- b) Why far transmission distance?
- 1) Power supply ripple is too large;
 - 2) The antenna types do not match, or not properly installed;
 - 3) The surrounding environment is harsh, strong interference sources;
 - 4) Surrounding co-channel interference;
- c) Why is receiving data correctly?
- 1) Improper parameter settings;
 - 2) Module data interface is bad.