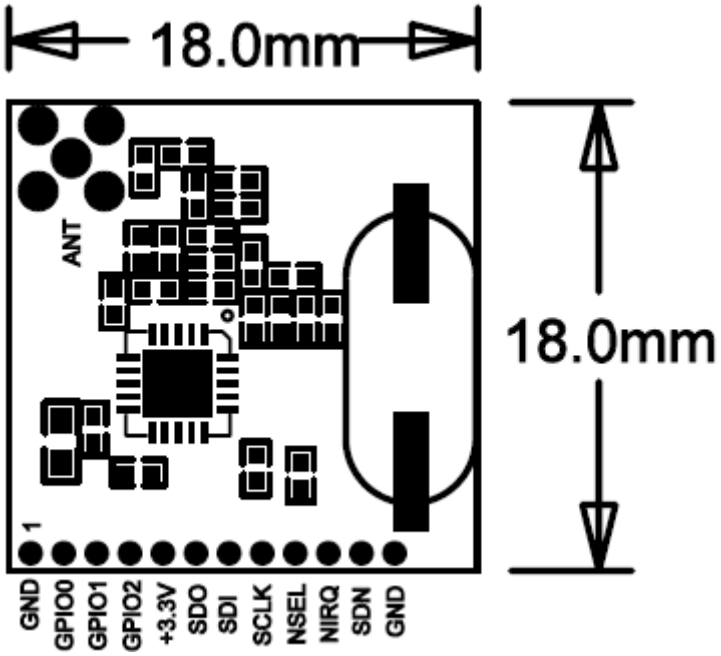
SRW1011 SUMMARY

1. Performance of the module

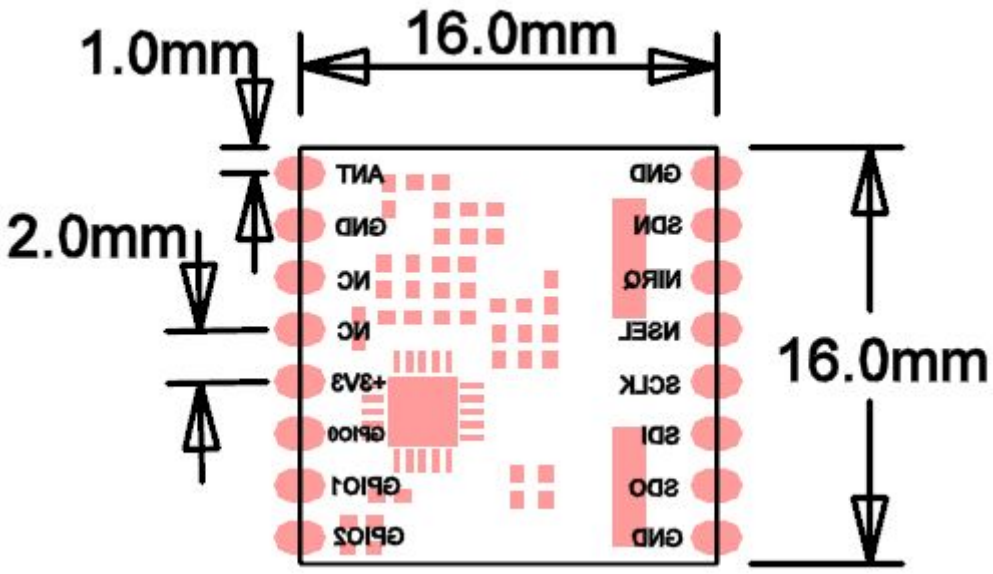
Product	Operating Freq.(MHz)	Supply Voltage	Modulation Type	Data Rate（kbps）	Sensitivity(@1.2kbps data rate 0.1%BER), Current consumption	Max. output power, current consumption	Current consumption(sleep mode)	Communication Range in Pure Environment
SRW1011	240-930	1.8-3.6	OOK,FSK,GFSK	0.125-256	-121,18.5mA	+13dBm,30mA	≤0.01uA	1000m

SRW1011 highly integrated, low cost TRx module which was covered from 240MHz to 930MHz ISM band. The extremely low receive sensitivity couple with industry leading +13dBm output power ensures the extended range and improved link performance. Lowest BOM cost and smallest PCB size 18mm×18mm。The module comply with RoHs standard,-40℃~+85℃ temperature range，it was also integrated wakeup timer, temperature sensor,FIFO,power-on- reset,GPIOs,high-performance ADC and DSP based modem. The modem performs demodulation,filtering,packet handling for increasing flexibility and performance which could make the design simplest and allow couple with the lower-end MCUs.We supply the RF design so that the customer could use it simply.。It is not necessary for the customer to debug the module when they use it.

2. Pin Descriptions



DIP Package



SMD Package

Pin	Pin Name	I/O	Description
1	GND	GND	Ground.
2	GPIO0	I/O	General Purpose Digital I/O that may be configured through the registers to perform various functions including: Microcontroller Clock Output, FIFO status, POR, Wake-Up timer, Low Battery Detect, TRSW, AntDiversity control, etc. See the SPI GPIO Configuration Registers, Address 0Bh, 0Ch, and 0Dh for more information.
3	GPIO1	I/O	
4	GPIO2	I/O	
5	+3.3V	VDD	+1.8 to +3.6 V supply voltage input to all analog +1.7 V regulators. The recommended V_{DD} supply voltage is +3.3 V.
6	SDO	O	0–V_{DD} V digital output that provides a serial readback function of the internal control registers.
7	SDI	I	Serial Data input. 0–V_{DD} V digital input. This pin provides the serial data stream for the 4-line serial data bus.
8	SCLK	I	Serial Clock input. 0–V_{DD} V digital input. This pin provides the serial data clock function for the 4-line serial data bus. Data is clocked into the SRW1011 on positive edge transitions.
9	NSEL	I	Serial Interface Select input. 0– V_{DD} V digital input. This pin provides the Select/Enable function for the 4- line serial data bus. The signal is also used to signify burst read/write mode.
10	NIRQ	O	General Microcontroller Interrupt Status output. When the SRW1011 exhibits anyone of the Interrupt Events the nIRQ pin will be set low=0. Please see the Control Logic registers section for more information on the Interrupt Events. The Microcontroller can then determine the state of the interrupt by reading a cor- responding SPI Interrupt Status Registers, Address 03h and 04h. No external resistor pull-up is required, but it may be desirable if multiple interrupt lines are connected.
11	SDN	I	Shutdown input pin. 0–V_{DD} V digital input. SDN should be = 0 in all modes except Shutdown mode. When SDN =1 the chip will be completely shutdown and the contents of the registers will be lost.
12	GND	GND	Ground.

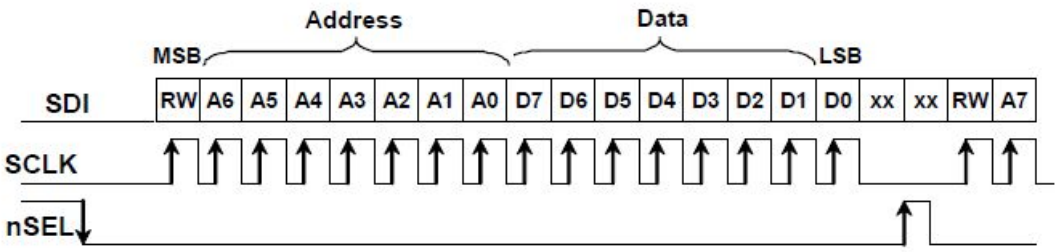
3.Features

- Frequency Range：240-930MHz
- Sensitivity：-121dBm
- Maximum Output Power：+13 dBm，-8dBm ~ +13dBm configurable
- Current Consumption：18.5mA（Rx）；30mA@+13dBm（TX）
- Data Rate：0.125-256kbps
- 1.8-3.6 V supply power
- Ultra low power shutdown mode
- RSSI
- Wake-on-Radio
- AFC
- Configurable packet structure
- Preamble detector
- TX and Rx 64bits FIFOs
- Low battery detector
- Temperature sensor and 8-bits ADC
- Temperature range：-40 ~ +85°C
- Integrated voltage regulators
- Frequency hopping capability
- FSK，GFSK and OOK modulation
- Low cost
- Power-on-reset

4. Interferences

The standard SPI

The module communicates with the external MCUs via the standard 4-wire SPI (NSEL, SCLK, SDI and SDO).Through SPI, the MCUs write/read the content of register to/out of the module. A SPI transaction is a 16-bits sequence, MSB is the symbol of write and read (read"0", write"1"), followed by a 7-bits address field, and then 8-bits data field. The following graphic is the SPI timing; the detailed infos please refer to the datasheet.



SPI Timing

Besides the byte read/write mode, the SPI interface contains a burst read/write mode which allows for reading/writing sequential registers without having to re-send the SPI address. You can refer to the datasheet for the burst mode timing.

You can use the SPI peripheral of the MCU to communicate with the RF module. If the MCU you use do not has SPI peripheral, you can also use the I/O ports of the MCU to simulate the SPI protocol and use them to communicate with the RF module. At this time, only 4 I/Os are used. So you can choose the cheapest MCU to design your product with our RF module.

5. Applications：

SRW1011 focus on short range wireless applications. Such as:

—Remote Control

—Home Security and alarm

—Telemetry

—Personal data logging

—Toy control

—Tire pressure monitoring

—Wireless PC peripherals

—Remote meter reading

—Remote keyless entry

—Home automation

—Industry control

—Sensor networks

—Health monitors

—Tag readers

6. Working Mode

Our RF module has packet handler which can handle the packet cleverly. When the packet handler is enabled, all the fields of the packet structure need to be configured. You can write data to the packet handler registers to configure them. After the packet handler registers are configured, the handler can receive/transmit the packet automatically. Our RF module has three working mode, they are FIFO mode, Direct Mode and PN9 mode.

In FIFO mode, the transmitted and received data is stored in integrated FIFO register memory. The FIFOs are accessed via “Register 0x7Fh, FIFO Access”, and are most efficiently accessed with burst read/write operation. You can refer to the datasheet for the detail information.

In direct TX mode, the TX modulation data is applied to an input pin of the chip and processed in “real time”. A variety of pins may be configured for use as the TX Data input function, this pin can be GPIO and others pins.

In direct Rx mode, the RX Data and RX Clock can be programmed for direct (real-time) output to GPIO pins. The microcontroller may then process the RX data without using the FIFO or the packet handler function of the RF module.

In PN9 mode the TX Data is generated internally using a pseudorandom (PN9 sequence) bit generator. The primary purpose of this mode is for use as a test mode to observe the modulated spectrum without having to provide data.

About the working mode, you can refer to the datasheet for the detail description.

7. Attachment

Our customers can use our tool which is named as “EasyTool” to calculate the setting values of the registers while they are developing their products. While using this tool, you can calculate the right setting values according to the RF parameters quickly. We also provide the sample code for all the customers. If you need them, please feel free to send us email with our support mailbox. High quality and immediate support is our goal. All the customers are welcome to bring forward their requests to design a special RF module according to their special requirements.

We also provide evaluation board for our RF modules. If you need it, please contact our sales guys. Using the evaluation board and the material we give, our customer can use our evaluation board to evaluate the performance of our RF modules quickly. At the same time, the customer can refer to our demo and design their solution easily.

Please feel free to contact us if you have any technical problem. Both email and call are welcome.