

User Guide To RF 915MHz ISM Module

第一章 硬件介绍 Chapter 1 HardWare Introduce

1.1 MSi4432 低功率无线模块硬件接口主要定义 Functional Block Diagram :

MSi4432 低功率无线模块硬件接口主要定义:

MSi4432 Low-power Wireless Module Hardware Interface - Main definitions:

芯片型号 Chip Model	引脚序号和名称定义 Pin Number and Definition					排针间距 Pin Header's Spacing
	1	2	3	4	5	
Si4432+78F0503A	V _{DD}	GND	RXD	TXD	RST	2.00mm

1.2 接口名称详细说明 (IO 输入输出状态以模块本身作为对象描述) Detailed Specifications of Interface Names (IO Input and Output Status Descriptions by treating Module itself as an object)

序号 S/N	接口名称 Interface Name	I/O	描述 Description
1	V _{DD}	电源 Power Supply	供电电压 3.3V, 输入电流 100mA。 Power supply voltage is 3.3 V; Input current is 100 mA.
2	GND	地 Ground	电路接地。 Circuit is grounded.
3	RXD	I	模块串行数据输入接口, 数字输入, 与模块 MCU UART 口 RX Pin 连接 Module's serial data is input to interface — as digital input, and is connected to the module's MCU UART port's RX Pin.
4	TXD	O	模块串行数据输出接口, 数字输出, 与模块 MCU UART 口 TX Pin 连接 Module's serial data is output to interface — as digital input, and is connected to the module's MCU UART port's TX Pin.
5	RST	I	模块 0 ~ 3.3V 数字输入, RST 低电平脉冲宽度>20uS 芯片复位, RST=1 芯片工作。 Module's 0 ~ 3.3 V digital input — RST low level pulse width is > 20 uS when chip resets; RST= 1 when chip is operating.

1.3 接口电气特征 **Interface's Electrical Characteristics**

最大额定值 **Maximum Rated Values**

参数 Parameter	符号 Symbol	条件 Conditions	额度 Limits	单位 Units
供电电压 Power Supply Voltage	V_{DD}		-0.5 ~ 3.6	V
	GND		-0.5 ~ +0.3	V
输入电压 Input Voltage	V_i	RXD, TXD, RST	-0.3 ~ $V_{DD}+0.3$	V
输出电压 Output Voltage	V_o	RXD, TXD, RST	-0.3 ~ $V_{DD}+0.3$	V
输出电流, 高 Output Current, High	I_{OH}	RXD, TXD, RST	-10.0	mA
		所有引脚总和 Total of All Pins	-25.0	mA
输出电流, 低 Output Current, Low	I_{OL}	RXD, TXD, RST	30.0	mA
		所有引脚总和 Total of All Pins	60.0	mA

DC 特征 **Characteristics**

参数 Parameter	符号 Symbol	条件 Conditions	最小值 Minimum Value	典型值 Typical Value	最大值 Maximum Value	单位 Units
供电电压 Power Supply Voltage	V_{DD}		1.8	3.3	3.6	V
输出电流, 高 Output Current, High	I_{OH}	$1.8\text{ V} \leq V_{DD} \leq 3.6\text{ V}$			-1.0	mA
输出电流, 低 Output Current, Low	I_{OL}	$1.8\text{ V} \leq V_{DD} \leq 3.6\text{ V}$			2.0	mA
输入电压, 高 Input Voltage, High	V_{IH}	RXD, RST	$0.8 V_{DD}$		V_{DD}	V
输入电压, 低 Input Voltage, Low	V_{IL}	RXD, RST	0		$0.2V_{DD}$	V
输出电压, 高 Output Voltage, High	V_{OH}	TXD	$0.8 V_{DD}$		V_{DD}	V

参数 Parameter	符号 Symbol	条件 Conditions	最小值 Minimum Value	典型值 Typical Value	最大值 Maximum Value	单位 Units
Output Voltage, High						
输出电压, 低 Output Voltage, Low	V_{OL}	TXD	0		$0.2V_{DD}$	V
上拉电阻 Pull-up Resistor	R_{PU}	RXD		10		k Ω

1.4 模块尺寸和接口位置图

Diagrams showing Dimensions of Module and Location of Interface

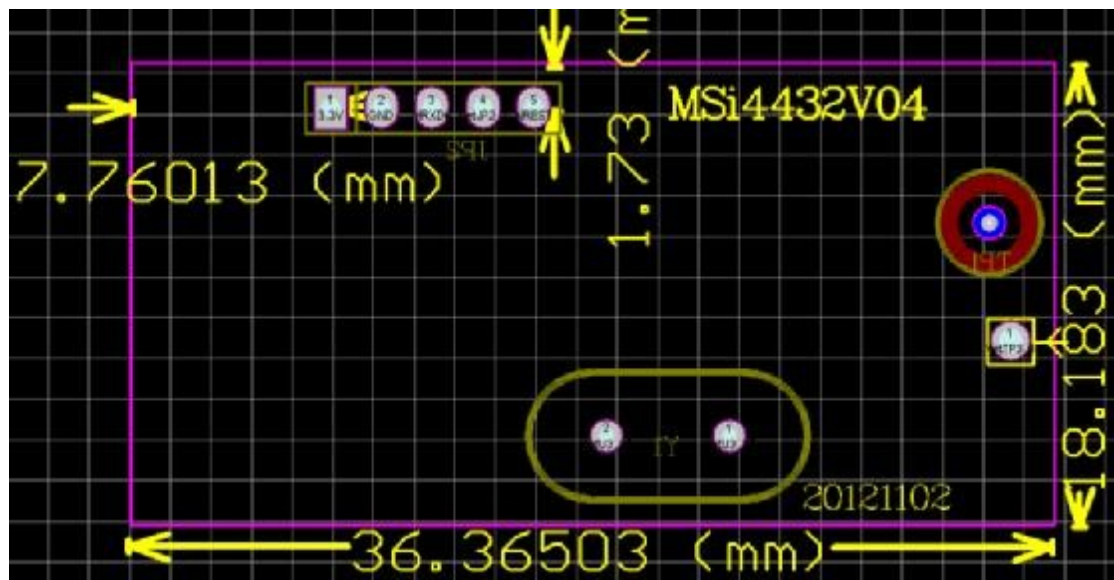


Figure 图 1: 接口位置和 PCB 板尺寸图

Interface's Location and PCB Board's Dimensions Diagram

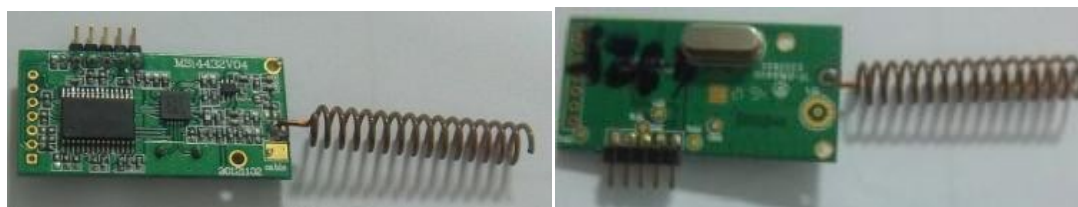


Figure 图 2: 模块实物图 Module's Physical 3D Picture/ Stereograph

1.5 接口参数 Interface Parameters

- 接口方式 Interface Method: UART, TTL 电平 Level,

串口波特率 9600bps, 8 数据位, 1 起始位, 1 个停止位, 偶校验位;

Interface baud rates 9600bps 8 Data bits, 1 Start bit, 1 Stop bit, with Even check bit.

b. 最大应用数据包 **Maximum Apply Data Packet** : 64 bytes;

第二章 软件介绍 **Chapter 2 Software Introduce**

2.1 通讯接口配置 **Com interface configuration**

配置主机串口波特率 9600bps, 8 位数据位, 1 位起始位, 1 位停止位和偶校验位;

Configuration Host Interface as baud rates 9600bps 8 Data bits, 1 Start bit, 1 Stop bit, with Even check bit.

2.2 数据接收和发送方式 **The method of send and receive data**

数据接收: 模块上电, 复位管脚 **RST** 处于高电平, 3S 后模块工作处于接收状态, 收到无线数据便转发数据到串口给主机, 接收数据长度不大于 64 字节;

Data receive: Power on the RF module and keep **RST** pin with high level, After 3 seconds Module works in receive states, When it received data from RF, module send the data to the Host by UART. The receive data less than 64 bytes.

数据发送: 模块上电工作, 当收到串口数据则将数据通过无线发送, 发送数据长度不大于 64 字节;

Data send: Power on the RF module, When it received data form UART, then send the data by RF channel. The send data less than 64 bytes.

2.3 复位模块 **Reset the module**

如果模块工作异常, 将复位管脚 **RST** 置低电平 100uS 以上, 模块重新复位, **RST** 保持高电平模块工作;

If the module work failure, Set **RST** pin to low level upto 100uS, Keep the **RST** pin for high level module restart work.

FCC Caution.

§ 15.19 Labelling requirements.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

§ 15.21 Information to user.

Any Changes or modifications not expressly approved by the party responsible for compliance

could void the user's authority to operate the equipment.

§ 15.105 Information to the user.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The MSi4432 module is designed to comply with the FCC statement. FCC ID is 2AC6H4432-A. The host system using MSi4432, should have label indicated contains the module's FCC ID

This radio module must not installed to co-locate and operating simultaneously with other radios in host system , additional testing and equipment authorization may be required to operating simultaneously with other radio.