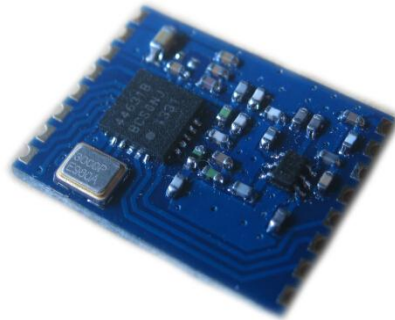High-performance FSK Wireless Transceiver Module

SPECIFICATION

Model No.： **DL-RTS4463**

Version: V1.1

Before using this module, please read this document carefully, and pay attention to the following important matters:

This module is an electrostatic sensitive product. Please operate it on an anti-static workbench during installation and testing.

The module uses an external antenna by default. The antenna can be a wire antenna or a standard UHF antenna. You can choose a specific antenna according to the actual situation. If the terminal product uses a metal shell, be sure to install the antenna outside the metal shell. Otherwise, the RF signal will be seriously attenuated, which will affect the effective distance.

Metal objects and wires should be kept away from the antenna as much as possible.

When installing the module, nearby objects should be kept at a sufficient safety distance from the module to prevent short circuit damage.

This module should be used in a dry environment. Please do not make any liquid substance come into this module.

Please use an independent voltage regulator circuit to supply power to this module, and avoid sharing with other circuits. The tolerance of the power supply should not be less than 5%.

Limitations:

This module is intended to be embedded in the customer's terminal product application, and does not provide a casing itself. It is not recommended that the customer directly resell this module as a final product without permission.

This series of modules are in accordance with commonly used international standards. If there is any special certification needed, we can adjust certain indicators according to your needs.

This module cannot be applied to life rescue, life-support systems, or any occasion where personal injury or life threatening may cause by equipment failure. Any organization or individual carrying out the above-mentioned applications shall bear all risks at their own.

We will not be responsible for any direct or indirect damage, injury or loss of profits caused by products that use this module.

DL-RTS4463 was designed base on Silicon Labs' Si4463 wireless transceiver chip. It is a compact, low-power, long-distance wireless transceiver module. The chip launched by Silicon Labs is mainly set to 315MHz, 433MHz, 868MHz, 915MHz and other special frequency bands of the national networks. The sensitivity can reach -124dbm, the maximum transmission rate can reach 1000Kbps, and the output power can range from -20dbm to + 20dbm through the register configuration.

This module integrates all RF-related functions. Users do not need to have a deep understanding of RF circuit design; they can use this module to easily develop wireless products with stable performance and high reliability, shortening the product development cycle.

The module adopts single-chip architecture, and the periphery adopts high-precision crystal, high-Q Murata inductor, small volume but high-capacity filter capacitor. All SMD components are used, and the interface is encapsulated with standard pitch stamps, which is conducive to the development of compact systems and the application of SMT in mass production.

1. Features:

● 2000m transmission distance (1200bps)

● Working frequency: 433.92m (other frequencies need to be customized)

● Operating voltage: 1.8V-3.6V

● Highest frequency performance, compare with other SiliconLabs series chips

● Low current loss in SHUTDOWN mode

● Efficient 4 - line SPI interface

● Separate 64-byte RX FIFO and TX FIFO

● Support WOR wireless wake-up function for portable devices

2. Applications:

● Wireless sensor;

● Home automation;

● Automated data collection;

● Industrial remote control, telemetry;

● Data monitoring and transmission;

● Home Appliance Control;

● Security, alarm control;

3. Pins Definition:
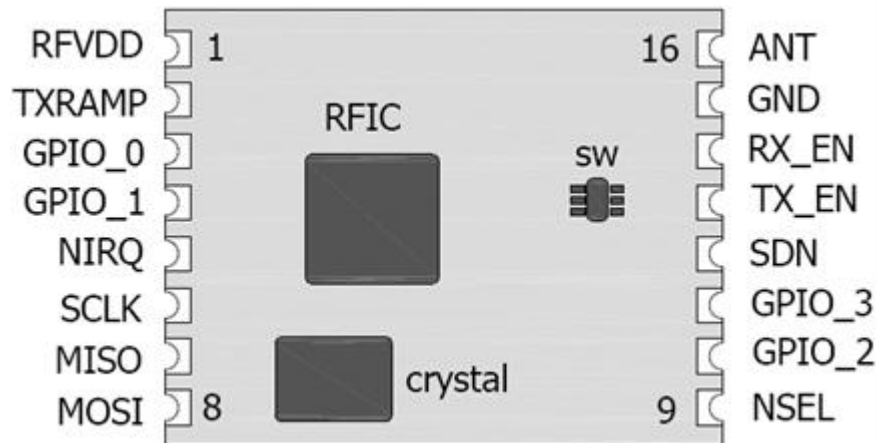
Pin	Name	Description	Remark
1	VDD	Power supply 3.3V	RF VDD
2	TXRAMP	Output of external PA, not used	
3	GPIO_0	GPIO0 pin, directly connected to the chip	
4	GPIO_1	GPIO1 pin, directly connected to the chip	
5	NIRQ	Interrupt input pin, output low level when interrupt is generated	Configuration register
6	SCLK	SCLK input. Provide four-line serial data clock function	
7	MISO	0~VDD Digital output	
8	MOSI	0~VDD Digital input	
9	NSEL	Input pin for serial interface select	
10	GPIO_2	GPIO2 pin, directly connected to the chip	
11	GPIO_3	GPIO3 pin, directly connected to the chip	
12	SDN	Turn off input pin, SDN = 0 or 1; Refer to IC specification	
13, 14	EN	RX_EN receive enable, TX_EN transmit enable	Electronic switch
15	GND	Grounding, common ground with the system	Pin16 = Antenna

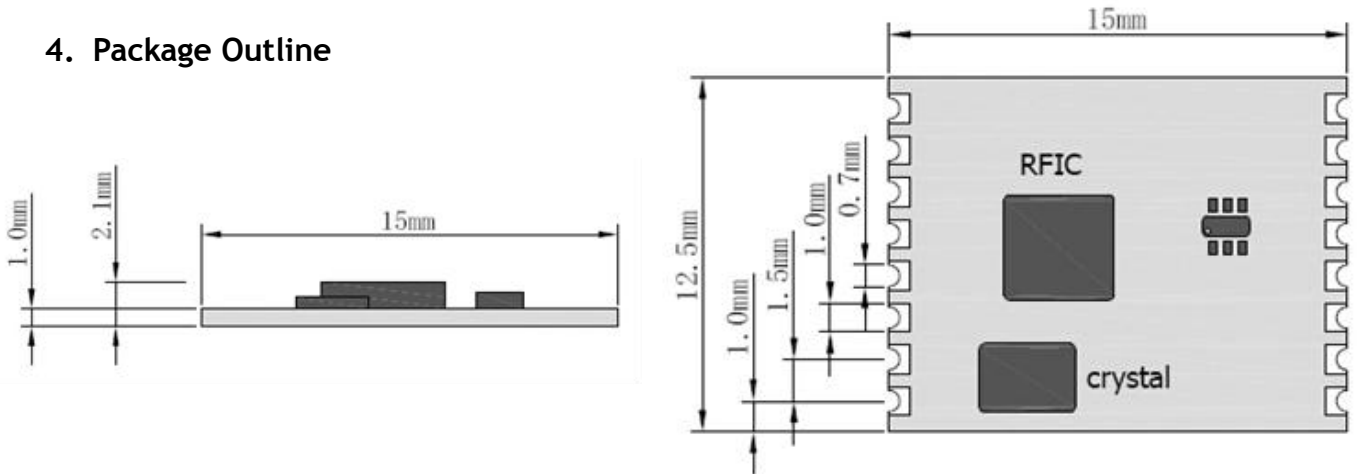Table 1: Pins Definition of DL-RTS4463 Module

4. Package Outline

Figure 1: Module size

5. Technical Parameter

DC characteristics

Description	Min.	Max.	Unit
Supply voltage	1.8	3.6	V
Working current	RX ＜13mA	TX=85mA@20dbm	mA
Standby current		＜1uA	mA
IO port voltage	Vss-0.3	Vdd+0.3	V
Working temperature	-40	85	℃

Table 2: DC characteristics of the Module

RF characteristics (Unless otherwise stated, the temperature is 25 ℃, and VCC is 3.3V)

No	Characteristics	Technical Parameter			Unit
		Min.	Typi.	Max.	
1	Frequency range	142	433.92	1050	MHz
2	Frequency interval		100K		Hz
3	Transmit power	-20		20	dBm
4	Receive sensitivity		-124		Dbm
5	Modulation	GFSK	2-FSK	OOK	MSK
6	Transmission rate	1.2		1000	Kbps

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7	Harmonic power	-45	——	-35	dBm
8	Communication distance	1800		2000	M
9	OOK Modulation mode, sensitivity		-112		dBm
10	OOK modulation mode, rate			120	Kbps
11	Standby power consumption			0.9	MHz
12	Crystal accuracy		10		PPM

Table 3: High frequency characteristic table of the module

6. Connection between module and terminal equipment (TTL electrical level)
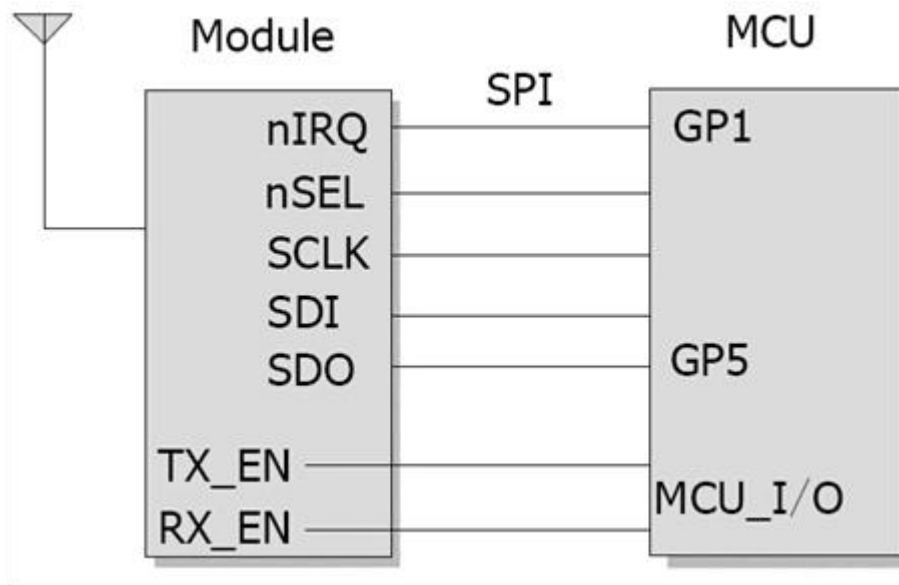

Figure 2:   Wiring diagram for module application

7. Problems in module application

Considering the complexity of data transmission over the air, the radio frequency modulation method of the data, and some inherent characteristics of electromagnetic waves, the following issues should be considered during the application process.

1. The electromagnetic interference of the application environment will affect the actual distance of the remote control. Electromagnetic wave interference is divided into mainboard power supply interference, TFT screen data cable interference, Flash data exchange interference; and airborne carrier frequency interference, noise interference, high-power signal source interference, etc.

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2. Factors such as product size, internal space, and coating of the shell will cause the attenuation of the wireless signal, which will affect the remote-control distance. Usually the narrow internal space of the product is not conducive to the extension of the antenna. The outer shell should avoid metal or metal plating as much as possible.

3. To choose a proper antenna is very important. The antenna is an important part of the communication system, and its performance directly affects the indicators of the communication system. We must pay attention to its performance (antenna type, antenna electrical performance) when selecting the antenna. Please feel free to contact us for consultation or recommendation, if you need.

8. Contact us

Shenzhen DreamLnk Technology Co., Ltd

★ Data collection, Smart home, Internet of Things applications, Wireless remote control technology, Remote active RFID, Antennas ★

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