

High-performance FSK Wireless Transceiver Module

# SPECIFICATION

Model No.: DL-RTC1101

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-RTC1101 was designed base on TI-Chipcon' S CC1101 wireless transceiver chip. It is a compact, long-distance, high-performance wireless transceiver module. The chip launched by TI-Chipcon is mainly set to 315MHz, 433MHz, 868MHz, 915MHz and other special frequency bands of the national networks. The sensitivity can reach -114dbm, the maximum transmission rate can reach 500Kbps, and the output power can range from -30dbm to + 10dbm 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.

There are 2 interface modes (SMD and DIP) been adopted, which can not only meet customers' SMT application, but also realize transverse and longitudinal welding through 2.0mm standard stitch arrangement. The small size of the module is convenient for portable products, and it can well meet the requirements of low-power system by combining with low-power MCU

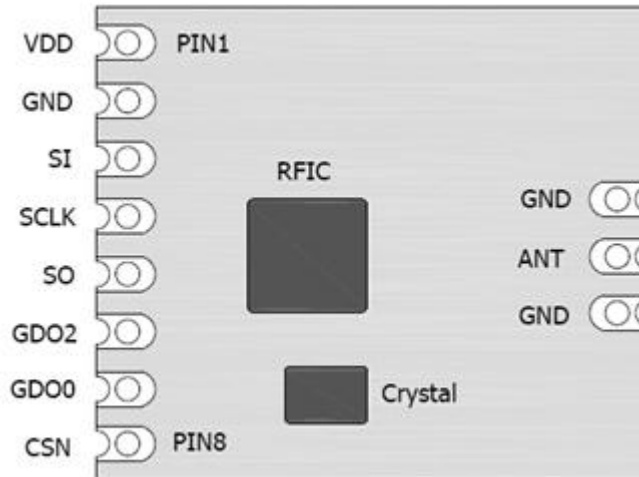
## 1. Features:

- 600m transmission distance (1200bps)
- Working frequency: 433.92m (other frequencies need to be customized)
- Operating voltage: 1.8V-3.6V
- The most classical product in the SUB GHz RF modules
- Support up to 255 independent channels, can achieve soft frequency hopping
- Separate 64-byte RX FIFO and TX FIFO
- Efficient SPI four-pins interface

## 2. Applications:

- Wireless sensor;
- Home automation;
- Automated data collection;
- Industrial remote control, telemetry;
- Data monitoring and transmission;
- Home Appliance Control;
- Security, alarm control;

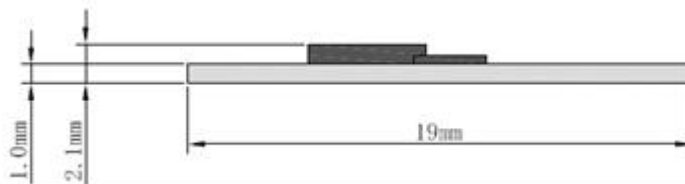
### 3. Pins Definition:



Pin	Definition	Function Description	Remark
1	VDD	Power supply 3.3V	RF VDD
2	GND	Grounding, common ground with the system	
3	SI	MOSI signals of SPI interface	
4	SCLK	CLOCK signals of SPI interface	
5	SO	MISO signals of SPI interface	
6	GDO2	GPIO2 pin, can be configured for other functions via registers	
7	GDO0	GPIO0 pin, can be configured for other functions via registers	
8	CSN	CS signals (chip selection) of SPI interface	
9	ANT	Antenna, standard 50Ω antenna interface	

Table 1: Pins Definition of DL-RTC1101 Module

### 4. Package Outline



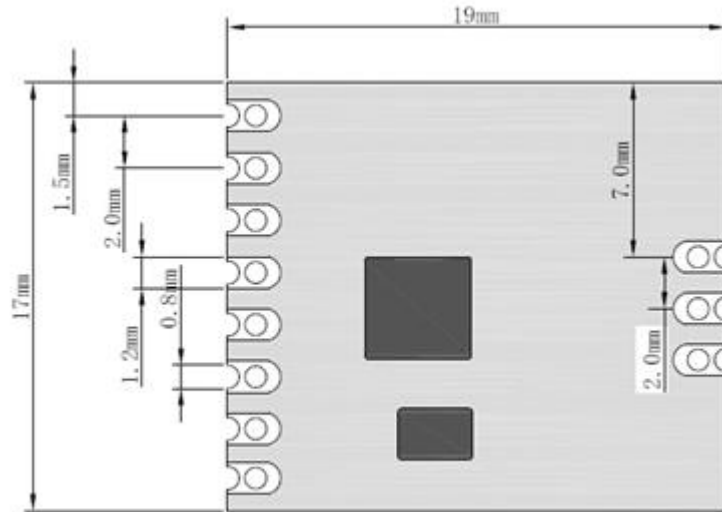


Figure 1: Module size

## 5. Technical Parameter

### DC characteristics

Description	Min.	Max.	Unit
Supply voltage	1.8	3.6	V
Working current	RX <16mA	TX=30mA@10dbm	mA
Standby current		<1uA	mA
IO port voltage	Vss-0.3	Vdd+0.3	V
Working temperature	-20	75	°C

Table 2: DC characteristics of the Module

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

No	Characteristics	Technical Parameter			Unit
		Min.	Typi.	Max.	
1	Frequency range	250	433.92	1000	MHz
2	Frequency interval		100K		Hz
3	Transmit power	-30		10	dBm
4	Receive sensitivity		-114		dBm
5	Modulation	GFSK	2-FSK	OOK	MSK
6	Transmission rate	1.2		500	Kbps

7	Harmonic power	-45	---	-35	dBm
8	Communication distance	500		600	M
9	OOK Modulation mode, sensitivity		-108		dBm
10	OOK modulation mode, rate			100	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)**

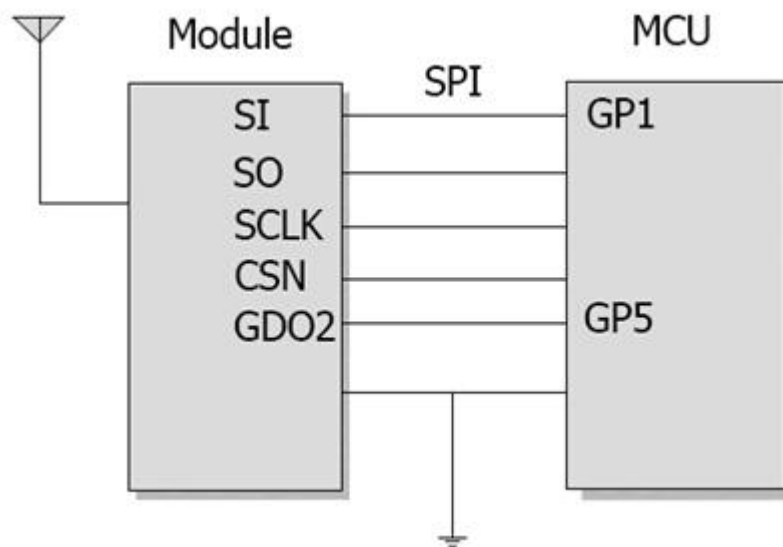


Figure 2: Wiring diagram for module application

**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.

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

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