

## High-performance 2.4G RF Transceiver Module

# SPECIFICATION

**Model No.: DL-24D8**

**Version: V1.1**



Before using this module, please 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.

This module defaults to using an external antenna, you can choose wire antenna or standard UHF antenna, according to the using condition, if there is metal case of the final product, please make sure install the antenna on the metal shell, otherwise it will lead to serious attenuation of radio frequency signals, which will affect the effective use of 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.

## 1. Brief Introduction of the Module

Designed base on TI-Chipcon's CC2500 wireless transceiver chip, DL-24D8 is a compact, cost-effective, remote wireless transceiver module, which is widely used in smart home, toy aeromodelling and close-range data transmission control fields. Sensitivity up to -98dbm, maximum transmission rate up to 500Kbps, output power through register configuration range from -30dbm to +1dbm.

The module integrates all RF related functions. You can easily develop wireless products with stable performance and high reliability directly, without in-depth understanding of RF circuit design, which will extremely shorten the development cycle.

There are 2 interface modes (SMD and DIP) been adopted, but manual welding is required due to different thermal expansion coefficient of the black glue and the binding wire inside. 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

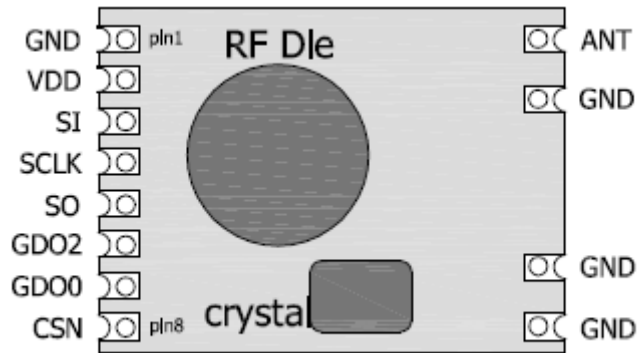
## 2. Features

- Working frequency: 2400-2483MHz
- Transmission distance: 100m in the open field (250Kbps)
- High reception sensitivity, up to -98dbm (2.4Kbps)
- Working voltage: 1.8~3.6V
- Programmable Carrier Detection, Digital RSSI Output
- Excellent selectivity and out-of-band isolation
- Gold plating PCB binding process, quite cost-effective
- Four-line SPI interface, strong versatility;

## 3. Typical application

- Wireless game controllers, toys
- Wireless keyboard, mouse
- Consumer electronics and toy aeromodelling
- Wireless voice/audio transmission
- Data monitoring transmission
- Intelligent home control
- Remoter that support radio frequency (RF) technology

### 4. Pins Definition

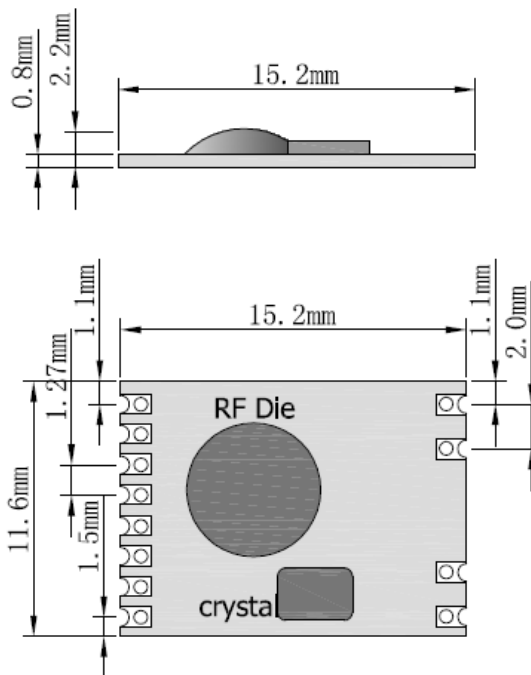


The DL-24D8 module has 8 pins, which are defined in the following table

No.	Definition	Function
1	GND	Grounding, common ground with the MCU system
2	VCC	Supply voltage, DC1.8~3.6V
3	SI	SPI Data input , MOSI
4	SCLK	SPI CLOCK
5	SO	SPI data output, MISO
6	GDO2	CLOCK Output
7	GDO0	System Data Input and Output
8	CSN	Chip Selection Pin, "CSN=0" valid

Table 1 Pin Definition of DL-24D8

### 5. Product Size :



## 6. Technical Parameters

### DC characteristics

Description	Min.	Max.	Unit
Supply voltage	1.8	3.6	V
Working current	RX<17mA	TX=22mA@0dbm	mA
Standby current		<1uA	mA
IO port voltage	Vss-0.3	Vdd+0.3	V
Working temperature	-20	75	°C

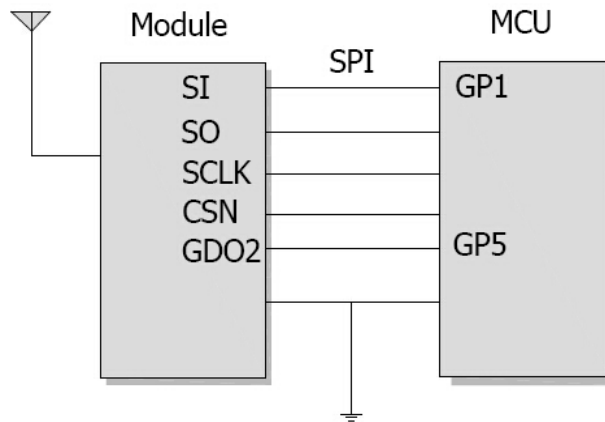
Table 2: DC characteristics of the Module

### 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	2400		2483.5	MHz
2	Frequency interval		100K		Hz
3	Transmit power	-30		1	dBm
4	Receive sensitivity		-89		dBm
5	Modulation	GFSK	2-FSK	OOK	MSK
6	Transmission rate	1.2		500	Kbps
7	Harmonic power	-48	---	-45	dBm
8	Communication distance	80		100	M
9	Sensitivity in 2.4k		-104		dBm
10	OOK modulation mode, rate			100	Kbps
11	Standby Power Consumption			0.9	uA
12	Crystal Precision *3225/ 2*6		10		PPM

Table 3: High frequency characteristic table of the module

## 7. Module connection diagram (TTL level)



## 8. 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.

## 9. Contact us

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