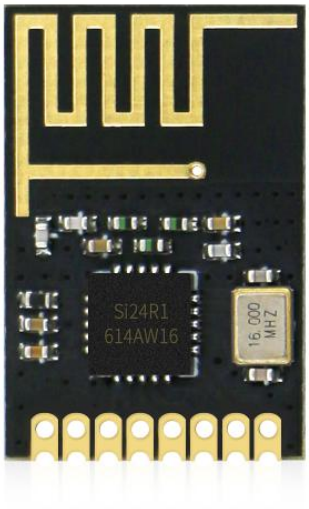
2.4G High Performance Wireless Transceiver Module

SPECIFICATION

Model No.: DL-Si24R1-A

Version: V1.0



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 DL-Si24R1-A module is integrated with all RF related devices and has PCB onboard antenna. 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 your product or application, and does not provide a casing itself. It is not recommended to resell this module directly 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.

This specification is subject to change due to the continuous improvement and upgrading of the product version, and the latest version specification shall prevail. This specification is just for your information, all the charts and pictures used in this specification are for reference only. The actual test shall prevail for details.

SHENZHEN DREAMLNK TECHNOLOGY CO., LTD reserves the right of final interpretation and modification of all contents in this specification.

Date	Version	Formulation / Revision of Contents	Approved by
2019-5-18	V1.0	DL-Si24R1-A Standard Version 2.4Ghz RF Module	Fagan Xu

1. Module introduction

1.1 Brief introduction

DL-Si24R1-A Wireless Module was designed based on Si24R1 RF transceiver chip from CSM-IC. It is an industrial grade 2.4G wireless module with PCB on board antenna, which is SMD packaging and compact in size. Its highest transmission rate can reach 2Mbps, while the maximum transmission power is about 7dbm.

This 2.4G Wireless Transceiver Module uses SPI interface, and adopts 16MHz crystal oscillator (high precision, high temperature stability), which is really an ideal product for various IoT applications, such as Smart Grid, Smart Home, Toy Aeromodelling, Medical Equipment, Sweeper Robot, Wireless Keyboard and Mouse, Wireless Remote Control, Active RFID, NFC, Wireless Sensor Nodes for Low power Ad Hoc Networks, etc.

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

This wireless module adopts stamp edge and half hole interface design, which can not only meet your SMT application, but also can realize transverse and longitudinal welding through pin header arrangement.

Remark:

1. Since DL-Si24R1-A is a pure RF transceiver module, MCU drivers or special SPI debugging tools are required.
2. DL-Si24R1-A 2.4G RF module is compatible with nRF24L01 RF modules, it is PIN to PIN with our DL-24N Wireless module, and also pin to pin with NF-03 RF module of Ai-Thinker.

1.2 Features

- High performance PCB antenna with transmission distance up to 100M;
- Modulation: GFSK/FSK;
- Air baud rate: 2Mbps/1Mbps/250Kbps;
- Transmission current: about 25mA, when the transmission power is 7dbm;
- Ultra-low power consumption: shutdown power consumption is about 1uA, while 15uA when standby;
- Working frequency: 2.4~2.525GHz, 126 channels in total, meet the special requirements of multipoint communication, grouping, frequency hopping, etc.;
- SPI communication interface, which can be directly connected to various MCUs;
- The recommended rate is 4Mbps, and the maximum rate can reach 10Mbps;
- The data packet can transmit 1~32Byte data each time;

- Wide power supply voltage range: 1.9-3.6V, supporting use at -40~+85℃.
- Gold plate PCB-ANT, high cost performance
- Industrial grade 16MHz crystal oscillator, with extremely high precision, high temperature stability, suitable for mass applications

1.3 Typical application

- Wireless remote control for toy model airplanes
- Intelligent education answering device
- Pet finder and tracker
- Medical equipment and remote control
- Logistics tracking, warehouse inspection, RFID
- Wireless applications for Consumer electronics
- Low-power remote sensing system
- Wireless sensor networking application

2. Technical Parameters:

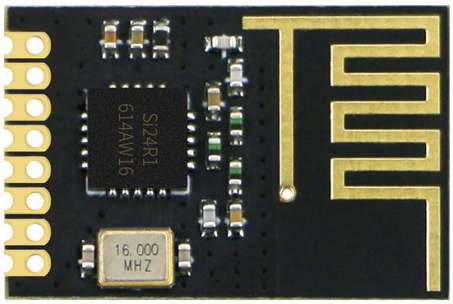
Limit parameters

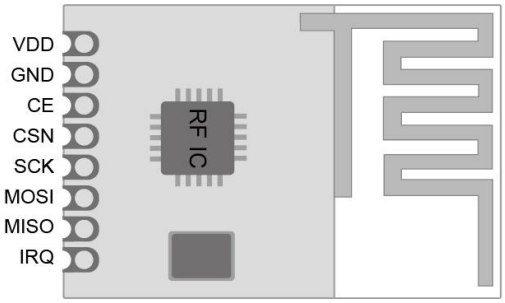
Main Parameters	Parameter Range	
	Min.	Max.
Power Supply (V)	1.9	3.6
Working Temperature (℃)	-40	+80

Main Parameters	Parameter Range			Remark
	Min.	Type.	Max.	
Power Supply (V)	1.9	3.3	3.6	3.3V is recommended to use, there is a risk of burnout if 5V adopted
Working Temperature (℃)	-40	-	+85	Industrial grade design
Working Frequency (GHz)	2.4	-	2.525	ISM band
Transmission Current (mA)		12		2Mbps & 0dBm

Receiving Current (mA)		15		2Mbps
Sleep Current (uA)		1		
Max. Transmit Power (dBm)		7		
Receiving Sensitivity (dBm)		-83dBm		2MHz
Air Baud Rate (bps)	250k	-	2M	User programming control
Transmission Distance (m)		100		

3. Pin Definitions





Pin	Definition	Function
1	VDD	Supply voltage, DC1.9-3.6V; while 3.3V is recommended; external ceramic filter capacitors is recommended to add
2	GND	Grounding, common ground with the system
3	CE	Module enable control pin
4	CSN	SPI chip selection Pin
5	SCK	SPI Clock
6	MOSI	SPI data input, MOSI
7	MISO	SPI data output, MISO
8	IRQ	Interrupt request pin, active low
Antenna	PCB	The original standard package, PCB onboard antenna

Table 1: Pin Definitions Of DL-SI24R1-A

4. Product Size:

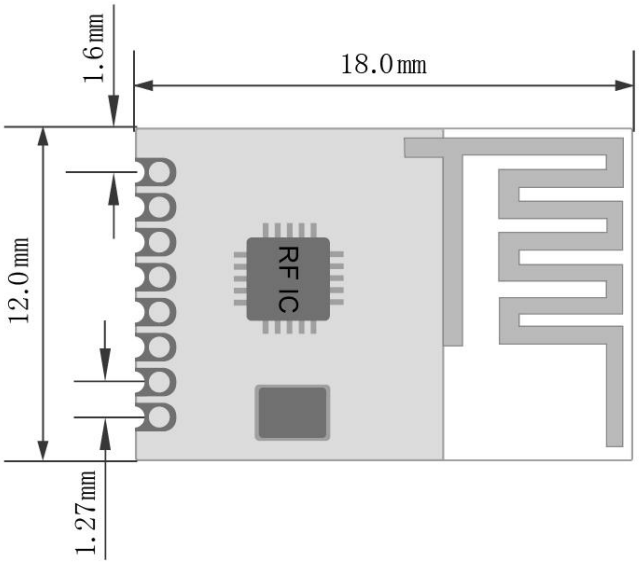


Figure 1: DL-SI24R1-A

5. Basic circuit diagram (SPI interface):

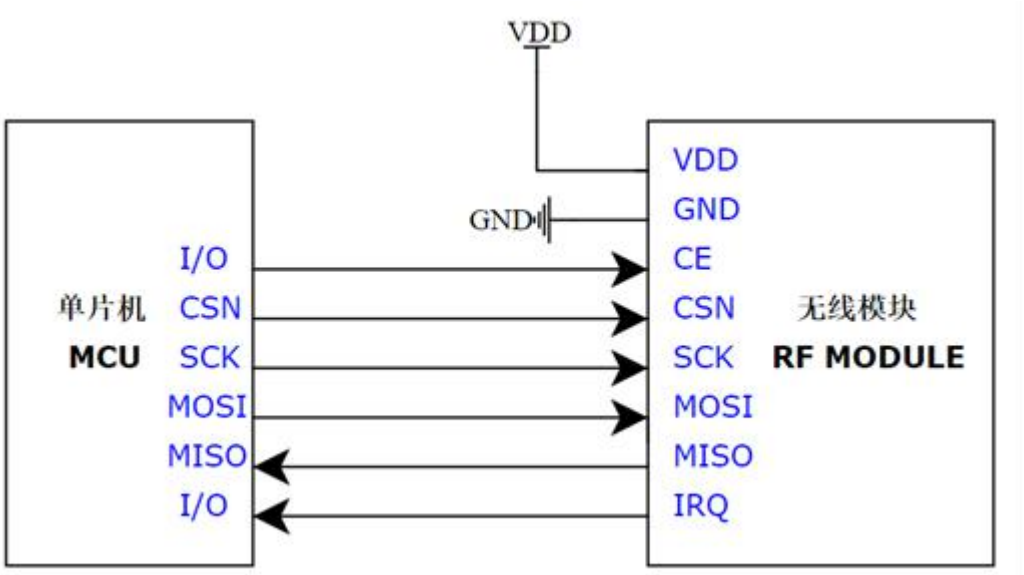


Figure 2: Module connection diagram

Description:

1. The high level of CE is Long-term effective. Set the working mode together with the PWR_UP bit of the CONFIG register. It is recommended to connect CE to the IO port of the MCU.
2. IRQ can be connected to the external interrupt of the MCU. If the MCU is not connected, the SPI query method can be used to obtain the interrupt status.
3. The RF chip used on this DL-Si24R1-A is Si24R1. Please follow the sequence of the chip manual to read and write the chip registers. Please refer to the Si24R1 chip manual for details.

6. Notice for Power Design in Practical Application

● Please pay attention to the power supply voltage of the device, exceeding the recommended voltage range will cause the module to function abnormally and permanently damage;
● Try to use a DC stabilized power supply to supply power to the module, and the power supply ripple coefficient should be as small as possible, and the power load when transmitting the maximum power needs to be considered;
● The module needs to be grounded reliably. A good paving can provide better performance output and reduce the impact of RF on other sensitive devices;
● The ground should not be too close to the RF trace and ANT at the same time, otherwise it will absorb the radiated energy;
● Keep away from high-frequency circuits, transformers, RF and other interference sources, and it is forbidden to route wires directly under the module, otherwise the receiving sensitivity may be affected.

7. Contact us

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

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