2.4G RF Transceiver Module with High Power

SPECIFICATION

Model No.: DL-24NPA

Version: V1.0

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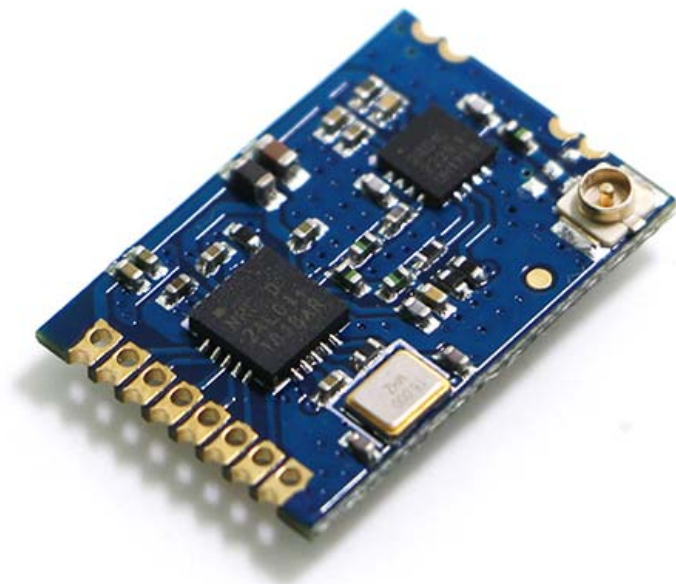
Before using this module, please pay attention to the following important matters:

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

DL-24NPA is an industrial grade 2.4G RF transceiver module with high power (100mW), it has high speed (max. air rate up to 2Mbps) with high stability, which adopts NORDIC original nRF24L01P RF chip and RFX2401C power amplifier chip with LNA built in. Receiving sensitivity is improved by 10dBm, and it works in 2.4Ghz ~ 2.5Ghz ISM band.

The output interface of this 2.4G module is IPEX, which is super small in size and conveniently embedded in the product. The module has the transmitting power of 20dBm, very good spectrum characteristic, small harmonic, and small crosstalk between channels. The high frequency material is originally from Murata, while the crystal is high precision and low temperature drift industrial-grade.

2. Typical application of the Module

Remote 2.4G Data Transfer Network
2.4G Answering Machine, Bidding unit
Star network data acquisition system
Shooting target ring system, scoring system
Remote control handle for aero-models and automobiles
2.4G remote control, air mouse, somatosensory game console
Controller for BLDC fan and ceiling fans
Controlling system of LED neon lamp string
Intelligent home system, security alarm, outdoor billboard control system

3. Features

Frequency range: 2.4GHz ~ 2.525GHz (adjustable 1MHz step)
Sensitivity up to -94 dBm
Maximum output power: 20 dBm
Low Receive Current: 23 mA
Sleep Current: 250 mA
Data transfer rate: 250K - 2Mpbs
Modulation modes: FSK and GFSK
Built-in antenna connector: IPEX base, ANT half-hole gold joint connector (external antenna available)
RSSI signal strength indication is not available, only simple packet loss statistics are

supported
Frequency Hopping function: 256 bytes FIFO and CRC
Built-in temperature sensor and low power indicator

4. Technical Parameters:

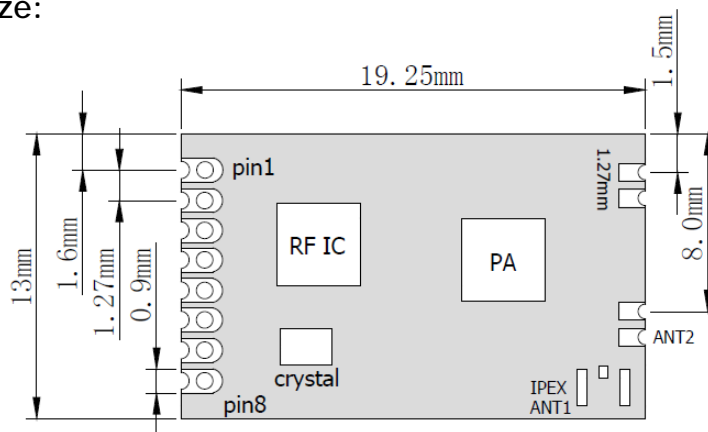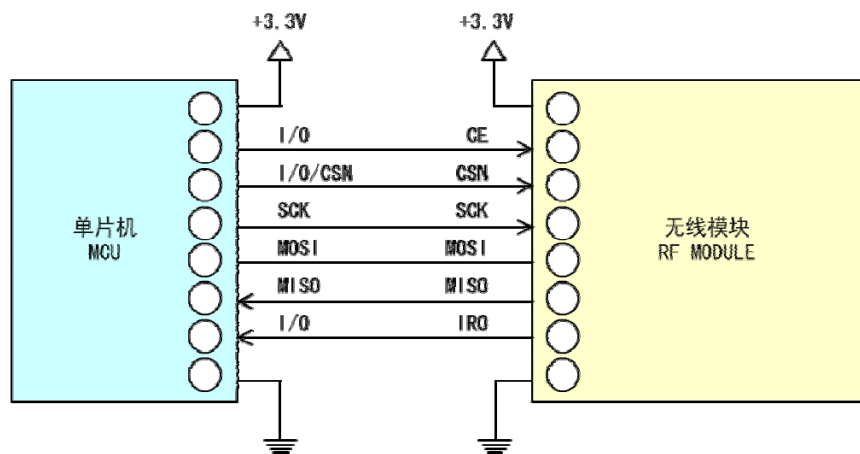| No	Parameter	Value	Remark
1	RF chip	nRF24L01P	Nordic
2	Module size	13*19mm	IPEX connector included
3	Weight	0.8g	IPEX connector included
4	Frequency band	2.5GHz~2.525GHz	Adjustable 1MHz step
5	Production process	Lead-free environmental protection process	No lead, no halogen, ESD anti-static
6	Interface mode	1*8*1.27mm	Stamp edge, sink gold half-holes process
7	Power supply	1.8~3.6V DC	Voltage above 3.6V will cause permanent damage to the module
8	Communication level	0.7VCC~5V	VCC means supply voltage
9	Measured distance	2000m	Clear and open field, maximum power, above 2m, 250K air speed
10	Transmission power	Max. 20dBm	100mW output power
11	Air speed	250k~2Mbps	3 levels adjustable（250kpbs、1Mbps、2Mpbs）
12	Switch off current	1.0uA	nRF24l01P Set to Power Down, CE Low Level
13	Emission Current	150mA 0dBm	Power supply capacity must be greater than 250mA
14	Receiving Current	23mA	CE=1
15	Interface	SPI	Maximum rate up to 10Mbps
16	Transmit Length	Single packet 1~32 bytes	3 levels FIFO
17	Receive Length	Single packet 1~32 bytes	3 levels FIFO
18	RSSI support	Unsupported	Only simple packet loss statistics are supported
19	Antenna interface	IPEX & ANT half hole	50Ω characteristic impedance
20	Working temperature	-40℃~+85℃	Industrial grade
21	Operating humidity	10%~90%	Relative humidity, no condensation
22	Storage temperature	-40℃~+125℃	Industrial grade
23	Reception sensitivity	-94dBm 250kbps	Details see RFX2401C（RFX→Skyworks）

5. Pins Definition
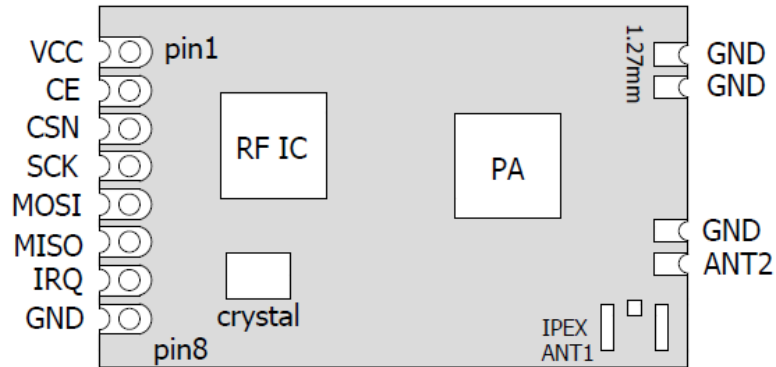
No.	Definition	Direction	Function
1	VCC		Power supply, range 1.8-3.6V, recommended 3.3V, recommended external ceramic filter capacitance
2	CE	Input	Module control pin, see nRF24L01P Datasheet
3	CSN	Input	Module Pick Pin, used to start a SPI communication
4	SCK	Input	Module SPI Bus Clock
5	MOSI	Input	Module SPI Data Input Pin
6	MISO	Output	Module SPI Data Output Pin
7	IRQ	Output	Interrupt signal output, low level effective
8	GND		Grounding, connect to power ground
ANT1, ANT2 are compatible interfaces, select by coupling capacitance, use different antenna types			

6. Product Size:

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7. Diagram of Connection

DL-24NPA Diagram of Link between RF Module and MCU

8. Notice in Module Application

CE can receive high level for a long time, but the module register must be set to Power Down mode at first. It is recommended to connect CE to IO port of the MCU.

IRQ can be disconnected, and the interrupt status can be obtained by SPI query, but it is recommended to use MCU external interrupt for connection.

The CE pin sequence operation of the module can use the high level time mentioned in the nRF24L01P technical manual to be greater than 10us, but it is better to change it to: SPI operation precedes high CE and keeps 1mS high level after the transmit interruption is completed, then lower CE. The purpose of this is to be compatible with our AS01 series modules with PA and LNA. The same code can be mixed with PA and without PA module, the selection is more flexible, and replacement is also easier.

Make sure that the grounding is good, large area of paving with small power ripple, the filter capacitance should be increased and as close as possible to the module VCC and GND pins.

This module uses NORDIC original nRF24L01P, and its registers are read and written in accordance with the nRF24L01P chip manual, which is detailed in the nRF24L01P manual.

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9. Related Products

Model	Frequency (Hz)	Chip	Scheme Packaging	Size (mm)	Transmitting Power (dBm)	Distance (Km)	Antenna
DL-24N	2.4~2.545G	NRF24L01P	SMD	12*19	0	0.12	PCB
DL-24S	2.4~2.545G	Si24R1	SMD	12*19	0	0.12	PCB
DL-24NPA	2.4~2.545G	NRF24L01P+PA	SMD	13*19	20	2.0	IPEX
DL-24SPA	2.4~2.545G	Si24R1+PA	SMD	13*19	20	2.0	External
☆ The above models can communicate with each other ☆							

10. 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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