



**成都亿佰特电子科技有限公司**  
Chengdu Ebyte Electronic Technology Co.,Ltd.

## E01-ML01DP5 Datasheet V1.0

### 1. Introduction

### E01-ML01DP5



E01-ML01DP5 is the iconic product of EBYTE. This nRF24L01+PA+LNA RF module operates at 2.4 GHz, with SPI interface and stable production, which make the module suitable for various applications.

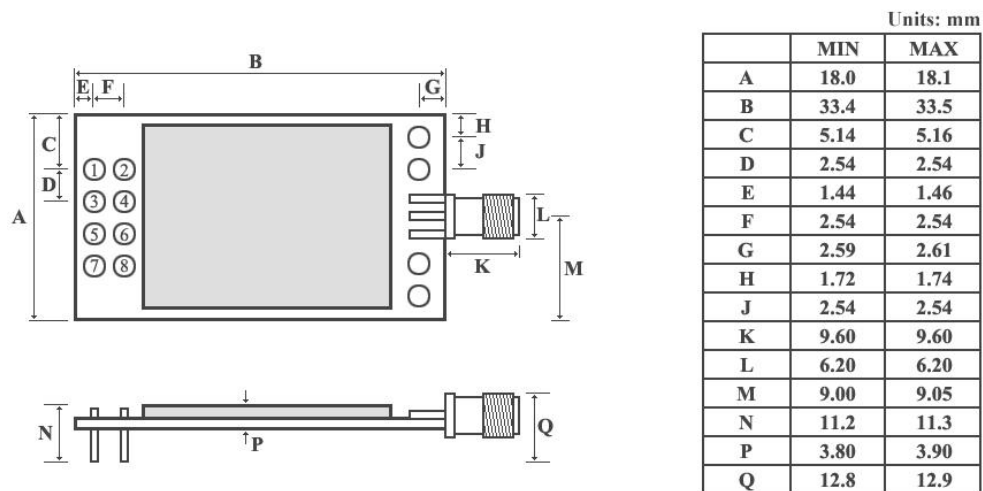
E01-ML01DP5 is based on original imported nRF24L01P from Nordic in Norway. And equipped with 20dBm power amplifier chip imported from USA, which makes the transmitting power achieves 100mW (20dBm) while the receiving sensitivity enhanced by 10dB.

Those features make the transmitting distance 10 times longer than nRF24L01P itself. The anti-interference shielding cover on the module makes the anti-interference performance better.

### 2. Electrical parameter

### E01-ML01DP5

No.	Parameter item	Parameter details	Description
1	RF IC	nRF24L01P	Nordic
2	Size	18 * 33.4 mm	Without antenna & SMA
3	Production process	Machine	Lead-free
4	Connector	2 * 4 * 2.54 mm	Plug-in
5	Supply voltage	2.0 ~ 3.6V DC	Notes: the voltage higher than 3.6V is forbidden
6	Frequency	2400 ~ 2525MHz	Adjustable
7	Communication level	0.7VCC ~ 3.6V	VCC refers to the supply voltage
8	Operation Range	2100m	Test condition: Clear and open area, 20dBm , antenna gain: 5dBi , height: 2m , Air date rate: 250Kbps
9	Max Power	Maximum 20dbm	About 100mW
10	Air data rate	3 level adjustable	250kbps, 1Mbps, 2Mbps
11	Sleep current	1.0uA	nRF24L01P sets as power-down
12	Transmitting current	120mA@20dBm	The largest emission current
13	Receiving current	26mA	CE=1
14	Communication interface	SPI	Data rate: up to 10Mbps
15	Transmitting length	3 level FIFO.	32 bytes (maximum) for one package
16	Receiving length	3 level FIFO.	32 bytes (maximum) for one package
17	RSSI support	N/A	Support simple data packet loss statistics
18	Antenna type	SMA-K	50 ohm characteristic impedance
19	Sensitivity	-106dBm	250kbps
20	Operating temperature	-40 ~ +85°C	Industrial-grade
21	Operating humidity	10% ~ 90%	Relative humidity, without condensation
22	Storage temperature	-40 ~ +125°C	Industrial-grade

**3. Pin definition****E01-ML01DP5**

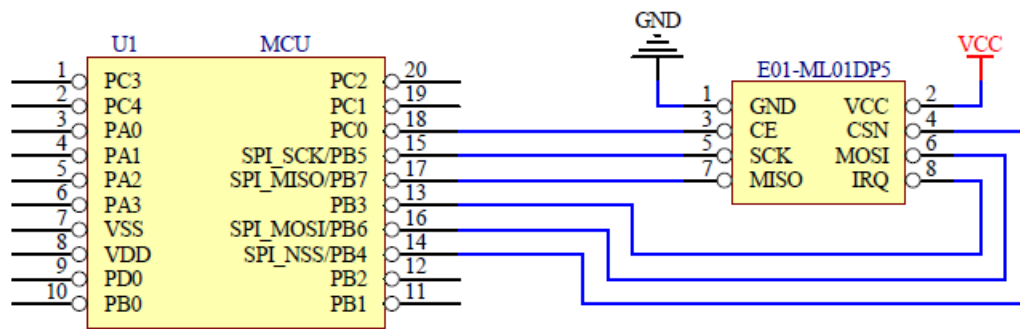
Pin No.	Pin item	Pin direction	Pin application
1	GND		Ground
2	VCC		Power supply 2.0V ~ 3.6V DC
3	CE	Input	Chip Enable
4	CSN	Input	SPI Chip select
5	SCK	Input	SPI clock
6	MOSI	Input	SPI master output slave input
7	MISO	Output	SPI master input slave output
8	IRQ	Output	Interrupt request.

**4. Note****E01-ML01DP5**

No.	Item	Attention
1	Static electricity	Please try not to touch the electronic components with bare hands.
2	Welding	When welding, soldering iron needs grounding. The producer needs to wear cable electrostatic bracelet which is grounding when mass production.
3	Power supply	Power quality has a great impact on the performance of the module, please make sure the power supply has small ripple and avoid the frequent and large jitter. $\pi$ filter is recommended(Ceramic capacitor // tantalum capacitor + inductance).
4	Ground	Single-point grounding is recommended. 0 ohm resistor or 10mH inductance are recommended.
5	Antenna	How to install antenna has a great impact on the performance of the module, please make sure the antenna is exposed and vertical upward. It will lead to the transmitting distance greatly weakened if the antenna installs in the interior of housing. When the module is installed in the interior of the housing, high-quality antenna extension line can be used to extend the antenna to the outside of the housing.
6	Interference	If there are different modules work in other frequency band in the same product, the user need to plan rationally and take measures to shield, in case the harmonic interference and intermodulation interference exist.

## 5. USAGE

## E01-ML01DP5



No.	Brief introduction of connection between module and MCU (STM8)
1	CE pin can be high level for long-term, but it needs to set as POWER DOWN mode when the module write registers, and it is recommended that CE is controlled by MCU pin.
2	As interrupt pin for IRQ, it can be used to wake-up MCU and achieve fast response; But the user can get the interrupt status through SPI (not recommended, it is not conducive to the overall power consumption, and with low efficiency) .

## 6. Drive mode

## E01-ML01DP5

No.	Description
1	This module is nRF24L01+PA+LNA, the drive mode is exactly equivalent to nRF24L01P, the user can operate according to the nRF24L01P manual (Please see nRF24L01P manual for more details).
2	Make sure the CE pin connect to LNA enable pin , when CE equal to 1, LNA is turned on, when CE to 0, LNA is turned off. This operation is perfectly matched with the transceiver mode of nRF24L01; that is to say, users do not have to care about the LNA operation
3	If the automatic response is needed, the CE pin must keep high level when transmitting, instead of keeping high level time just more than 10us like the datasheet mentioned. The operation we recommended is: when CE equal to 1, the module begin sending, after sending all, then make the CE equal to 0, instead of making the CE equal to 0 after 10 us. The reason is: the module turns into receiving mode immediately after sending L01P, If CE equal to 0,it means LNA closed, will not be beneficial to the receiving senility

## 7. Series of products

## E01-ML01DP5

Model	RF IC	Package	Power	Range	Antenna Type
E01-ML01S	nRF24L01P	SMD	0dBm	100m	PCB
E01-ML01D	nRF24L01P	Plug-in	0dBm	100m	PCB
E01-ML01IPX	nRF24L01P	SMD	0dBm	100m	IPEX
E01-ML01DP3	nRF24L01P	Plug-in	20dBm	1100m	SMA-K
E01-ML01DP4	nRF24L01P	Plug-in	20dBm	800m	PCB
E01-ML01DP5	nRF24L01P	Plug-in	20dBm	2100m	SMA-K
E01-ML01SP2	nRF24L01P	SMD	20dBm	1200m	PCB /IPEX
E01-ML01SP4	nRF24L01P	SMD	20dBm	1800m	IPEX

**8. FAQ****E01-ML01DP5**

★ Operation Range is too short to reach the ideal distance		
1	Barrier	2.4G frequency features with poor penetration due to its physical properties, it has deep influence on the operation range when there are barriers.
2	Interference resource	Temperature, humidity, same frequency interference can increase the packet loss rate of the communication
3	Metal	Metal objects around the antenna, antenna placed inside metal case, which cause the signal attenuation badly.
4	CE Pin	If the pin cannot keep high level when transmitting, it may lead to the lower receiving sensitivity when receiving signals.
5	Parameter values	Wrong parameter setting. Setting the air data rate too high, which lead to the shorter distance.
6	Low voltage	When the voltage below 3.3V, the lower the voltage is, the lower the transmitting power can be.

**9. About us****E01-ML01DP5**

Chengdu Ebyte Electronic Technology Co., Ltd is a high-tech company, focus on wireless transmission. Our company owns a number of independent research & development products and obtain unanimously approved customers. With powerful R&D team, our company can provide customers with perfect After-sales service and technical assistance.



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