



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

E11-MLU1PA Datasheet V1.0

1. Introduction

E11-MLU1PA



E11-MLU1PA is a 100mW wireless transceiver module, operates at 2.4 GHz with small-size and USB interface. With high-performance PCB antenna and stable batch production, the module is suitable for various applications.

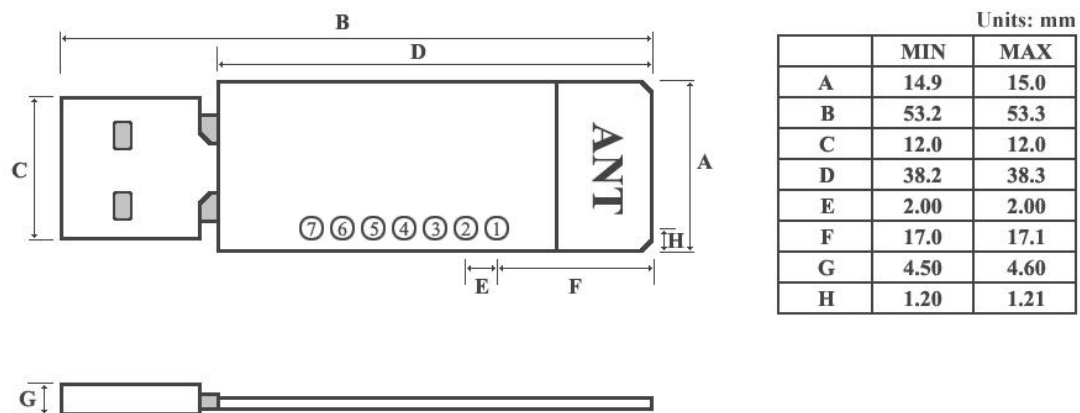
E11-MLU1PA is based on original imported RF chip nRF24LU1 form Nordic in Norway. With USB interface, imported industrial components, lead-free process, embedded 51 microcontroller, stable performance, high communication speed and small-size by professional hardware design, E11-MLU1PA is suitable for all kinds of USB development.

Can be compatible with E01 (nRF24L01+) and E05 (nRF24LE1) .

2. Electrical parameter

E11-MLU1PA

No.	Parameter item	Parameter details	Description
1	RF IC	nRF24LU1	Nordic
2	Size	15 * 53.3mm	Without USB
3	Production process	Machine	Lead-free
4	Connector	USB	Plug into computer directly
5	Supply voltage	3.7 ~ 5.25V DC	Aluminum battery is available
6	Frequency Band	2400 ~ 2525MHz	Adjustable
7	Communication level	0.7VCC ~ 3.6V DC	VCC refers to the supply voltage
8	Operation Range	About 1000m	Test condition: Clear and open area, 20dBm , height: 2m , Air date rate: 1kbps
9	Transmitting power	Maximum 20dbm	About 100mW
10	Air data rate	3 level adjustable	250kbps、 1Mbps、 2Mbps
11	Sleep current	500uA	MCU and wireless are disabled, VCC=5V
12	Transmitting current	95mA@20dBm	The largest emission current
13	Receiving current	22mA	Receives an average current
14	Communication interface	USB	See details in pin definition
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	PCB	50 ohm characteristic impedance
19	Sensitivity	-94dBm	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**E11-MLU1PA**

Pin No.	Pin item	Pin direction	Pin application
1	GND		Ground
2	CSN	Input	Chip select
	P0.3	Input/Output	MCU GPIO
3	MISO	Output	SPI output
	P0.2	Input/Output	MCU GPIO
	TXD	Output	UART output
4	MOSI	Input	SPI input
	P0.1	Input/Output	MCU GPIO
	RXD	Input	UART input
5	SCK	Input	SPI clock
	P0.0	Input/Output	MCU GPIO
6	PROG	Input	Program enable (floating)
7	VBUS		Power supply +5V

4. Note**E11-MLU1PA**


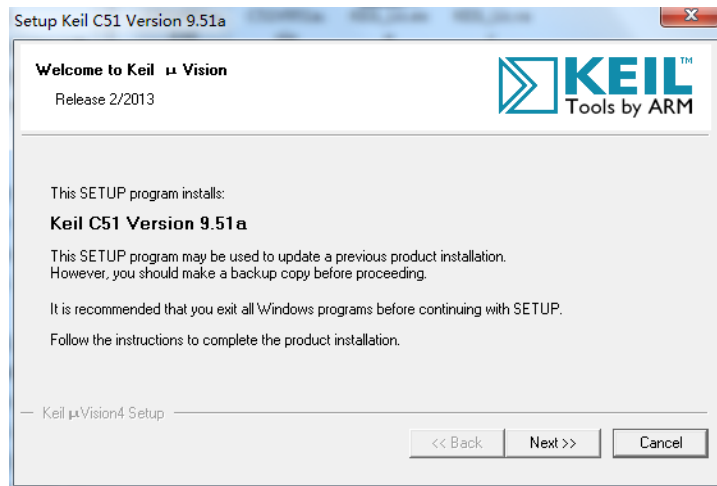
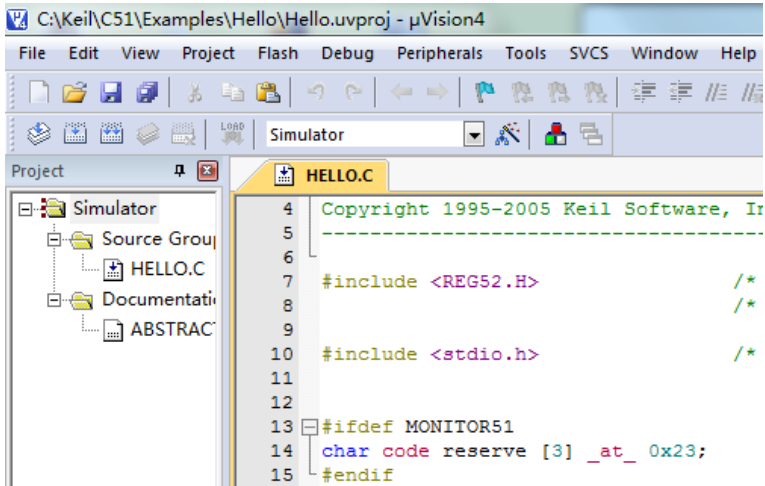
No.	Item	Attention
1	Static electricity	Please try not to touch the electronic components with bare hands.
2	Ground	Single-point grounding is recommended. 0 ohm resistor or 10mH inductance are recommended.
3	Antenna	How to install antenna has a great impact on the performance of the module, please make 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.
4	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.

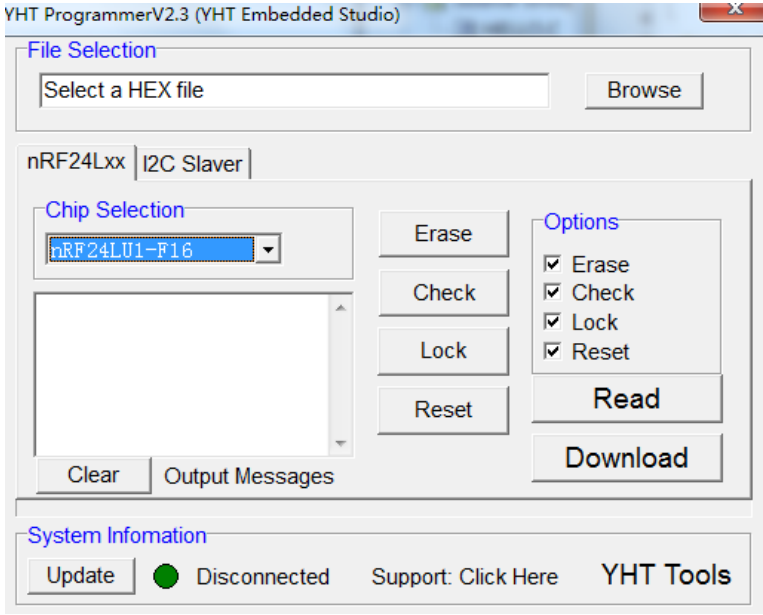
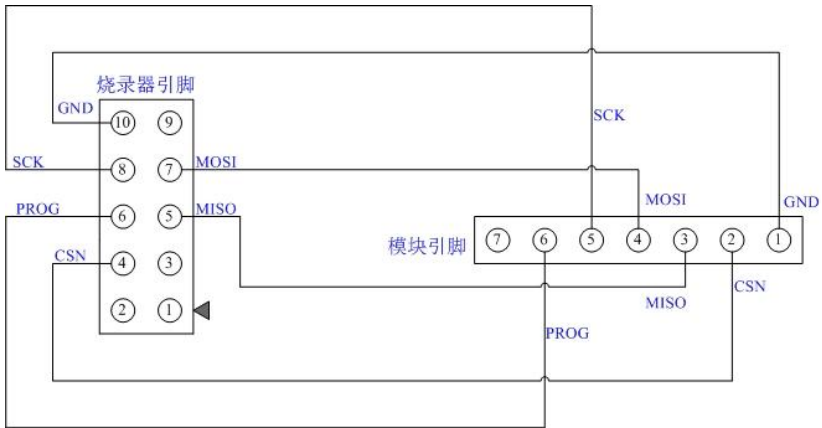
5. PA control**E11-MLU1PA**

The pin status of E11-MLU1PA when transmitting and receiving as below.

No.	Key words	Transmitting	Receiving
1	MCU GPIO	P0.4 can output either high level 1 or low level0.	Only high level 1 can be output by P0.4

6. USAGE**E11-MLU1PA**

No.		Notes
1	Download firmware	<p>Embedded 51 MCU, KEOLC51 can be used for software development, Program-download can only use our specified downloader YHT01-PROG</p> 
2	Software Installation	<p>Data package is provided with compiler software C51 KEIL installation package, double-click C51V951a.EXE to enter setup after decompressing</p> 
3	Compiler software	<p>The interference as following, Please see KEIL manual for more details(help manual)</p> 

4	Download software	<p>Programming software YHT Programmer.exe, doesn't need to install, can be used directly. The user can choose chip or HEX file to do the operations of download, read, erase and encryption. The interface is as follows:</p> 
5	Download program	<p>Demo program can be provided for user as reference., User can download the compiled HEX file directly, or modify on the basis of primary code to achieve their needs.</p> <p>E11 series module power on, GND, CSN, MISO, MOSI, SCK, and PROG Pin are connected to the corresponding pin on the YHT01-prog download device, see chart below</p> <p>The user can use the YHTProgrammer-2.3.exe programming HEX file after connecting the hardware, see the YHT01-prog downloader manual for more details</p> 
6	communication test	<p>Download the HEX files provided by our company to two E11 series modules by the methods above</p>

6. Series of products**E11-MLU1PA**

Model	RF IC	Package	Power	Range	Antenna Type
E11-MLU1	nRF24LU1	USB	0dBm	100m	PCB
E11-MLU1PA	nRF24LU1	USB	20dBm	1000m	PCB

7. FAQ**E11-MLU1PA**

★ 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	Parameter values	Wrong parameter setting. Setting the air data rate too high, which lead to the shorter distance.
5	Low voltage	When the voltage below 3.3V, the lower the voltage is, the lower the transmitting power can be.

8. About us**E11-MLU1PA**

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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