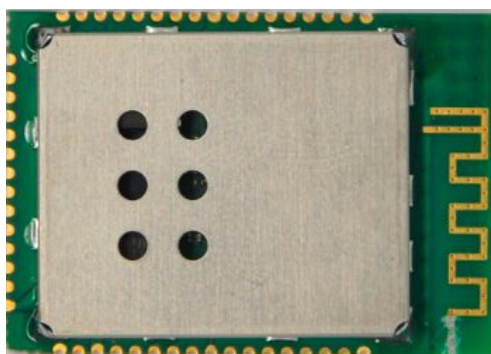


Lierda Science & Technology Ltd

LSD SCIENCE & TECHNOLOGY CO., LTD.

LSD4WF-2MD05101 Low Power Wi-Fi Module User Manual



FCC ID:N8NLS4WF

Model : LSD4WF-2MD05101

Name : Wi-Fi Module

Revision : v1.0

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1. Product overview

1.1 General Description

LSD4WF-2MD05101 is a Wi-Fi module for any electronic device to achieve networking capabilities. The module is fully in line with the 802.11b/g/n international standard specification, the internal integrated high performance Cortex M4 and Wi-Fi chip make it easy to access the serial port equipment or MCU control equipment to network, so as to realize wireless networking.

Built-in TCP/IP protocol stack, supports STA/AP/STA+AP coexistence working modes, supports 802.11b/g/n protocol, supports wireless local upgrade and OTA remote firmware upgrade.

32.8mmx23.1mmx3.2mm, using the stamp hole package, built-in board PCB antenna.

1.2 Features

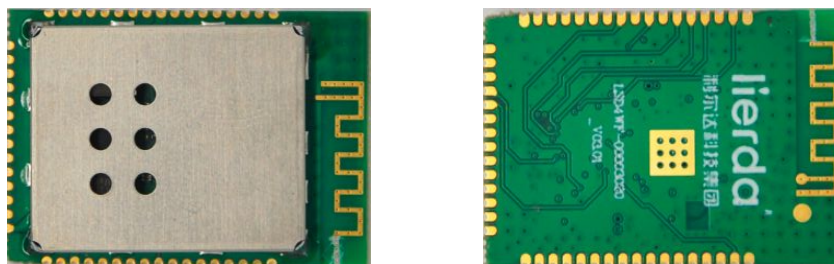
- ◆ Confirm with 802.11b/g/n protocol.
- ◆ Built-in high performance M4 core MCU, highest frequency 100MHz, high speed data processing ability.
- ◆ USART/GPIO/SPI/PWM multiple interface.
- ◆ QJoine high speed link configuration.
- ◆ Support STA/AP/STA+AP coexist work mode.
- ◆ Support WPA/WPA2/WEP encryption.
- ◆ Support wireless, Web page and OTA remote hardware upgrading.
- ◆ Support multiple net protocol communication.
- ◆ Provide abundant AT+ instruction set configuration.
- ◆ Optional built-in on board PCB antenna and external antenna interface.
- ◆ Dimension: 32.8mmx23.1mmx3.2mm, Stamp hole paste.
- ◆ 3.3V single power supply.
- ◆ CE/FCC.
- ◆ RoHS.

2. Parameters

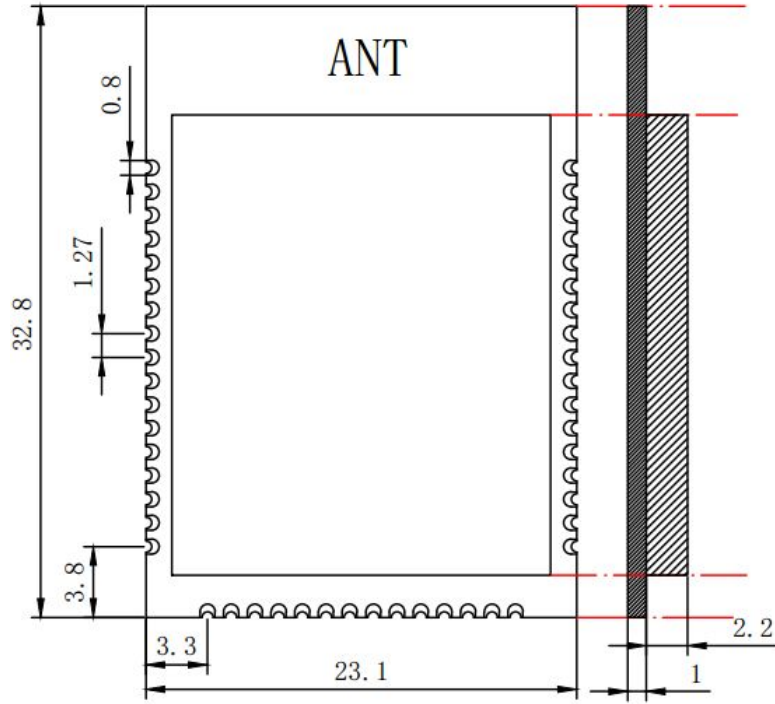
	Parameters	
Wireless Parameters	Standard	802.11 b/g/n
	Frequency	2.412GHz-2.462GHz
	Emitting power	802.11b:+9.82dBm(@11Mbps)
		802.11g:+8.27dBm(@54Mbps)
		802.11n:+8.12dBm(@HT20,MCS7)
	Receiving Sensitivity	802.11b: -83 dBm (@1Mbps ,CCK)
		802.11g: -74dBm (@54Mbps, OFDM)
802.11n: -61dBm (@HT20, MCS7)		
Antenna	Built-in: On board PCB antenna	
Hardware Parameters	Working Voltage	3.3V (3.0V~3.6V)
	Working Current	Quiescent Current: ~20mA Emitting peak Current: ~200mA
	Working Temperature	-40°C ~ 85°C
	Hardware Interface	USART/GPIO/SPI/PWM
	Dimension	32.8mmx23.1mmx3.2mm
Software parameters	Wireless network type	STA/API/STA+AP
	Security Mechanism	WEP/WPA-PSK/WPA2-PSK
	Encryption	WEP/AES/TKIP
	Hardware upgrading	Local wireless upgrading/ Web page upgrading/ Remote upgrading
	Network Protocol	IPv4, TCP/UDP/FTP/HTTP
	User Configuration	QJoine Configuration, AT+instruction, Web page

Pic1-1 LSD4WF-2MD05101 Basic Parameters

3. Package



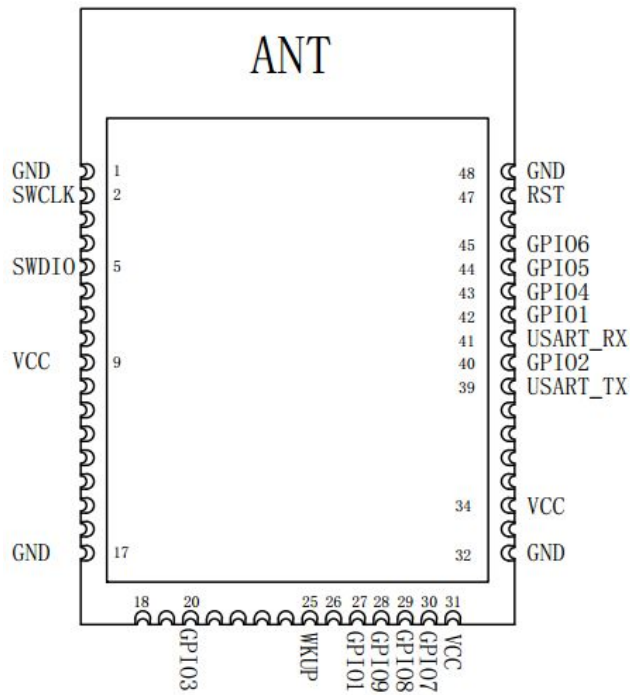
Pic 1-2 LSD4WF-2MD05101 Front and back



Unit: mm

Pic 1-3 LSD4WF-2MD05101 module package dimension

4. Pin definition



Pic 1-4 LSD4WF-2MD05101 Module pin layout

Pin	Pin definition	Function
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1	GND	Ground pin
2	SWCLK	Program download port
5	SWDIO	Program download port
9	VCC	Power supply pin (DC_3.3V)
17	GND	Ground pin
20	GPIO3/USART_CK/TIM1_CH1	Multiplex pin: IO port/USART / Timer
25	WKUP	Module wake up
27	GPIO1/USART_CTS/TIM1_CH4/SPI4_MISO	Multiplexed pin: IO port/USART /timer/SPI port
28	GPIO9/SPI4_SCK/TIM1_CH1N	Multiplex pin: IO port/SPI port/timer
29	GPIO8/SPI4_NSS/TIM1_BKIN	Multiplex pin: IO port/SPI port/timer
30	GPIO7/ADC1_1/TIM2_CH2&TIME5_CH5/SPI4_MOSI	Multiplex pin: IO port/ADC/timer/SPI port
31	VCC	Power supply pin (DC_3.3V)
32	GND	Ground pin
34	VCC	Power supply pin (DC_3.3V)
39	USART_TX	USARTport Data sendng port
40	GPIO2/USART_RTS/TIM1_ETR	Multiplex pin: IOport/USARTport/timer
41	USART_RX	USARTportdata receiver
42	GPIO1/USART_CTS/TIM1_CH4/SPI4_MISO	Multiplex pin: IOport/USARTport/timer/SPIport
43	GPIO4/ADC1_9/TIM3_CH4/nLink	Multiplex pin: IOport/ADC/timer
44	GPIO5/ADC1_8/TIM3_CH3/nReady	Multiplex pin: IOport/ADC/timer
45	GPIO6/ADC1_4/nReload	Multiplex pin:IOport/ADC
47	RST/nReset	Reset pin
48	GND	Ground pin

Table 1-1 LSD4WF-2MD05101 Module pin definition

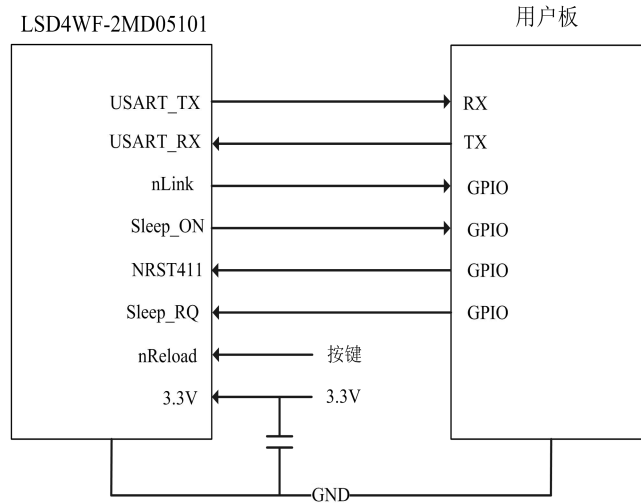
5. Behavior of electricity

Parameters	Minimum	Typical value	Maximum	Unit
Working voltage	3.0	3.3	3.6	V
Standby current		5		mA
Static current		20		mA
TX current		200		mA

RX current		50		mA
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Table1-2 LSD4WF-2MD05101 behavior of electricity

6. Typical application



Pic1-5 LSD4WF-2MD05101 Typical circuit connection

Pin	State	Remark
NRST411	Input, valid in low level	Module reset pin with internal pull resistor
nlink	Output (connected to LED)	Check the network state of module or indication for batch upgrade or configuration
nReload	Input, valid in low level	Connect button to chip pin for factory setting restoring
Sleep_RQ	Input, standby control	Connect button to chip pin for module dormancy managing
Sleep_ON	Output, standby state indication	Indication of dormancy state, connected with LED
USART_TX/USAR T_RX	Serial port transceiver port	Serial port transceiver port

Table 1-3 Connection introduction of cardinal pin

7. Reference design

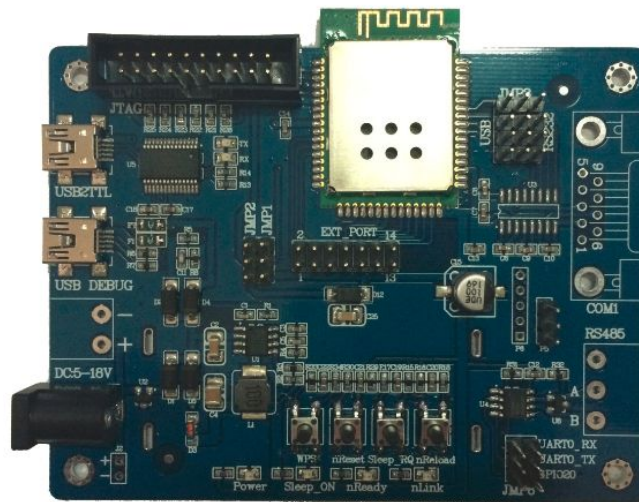
PCB onboard antenna is built in LSD4WF-2MD05101 module, users should using onboard antenna design need to be cautious that:

- 1, No components or GND on antenna area of user board
- 2, Keep antenna away from metal, stay over 10mm away from surrounding higher components.
- 3, Antenna can't be covered by metal case and it should be over 10mm away from plastic casing.

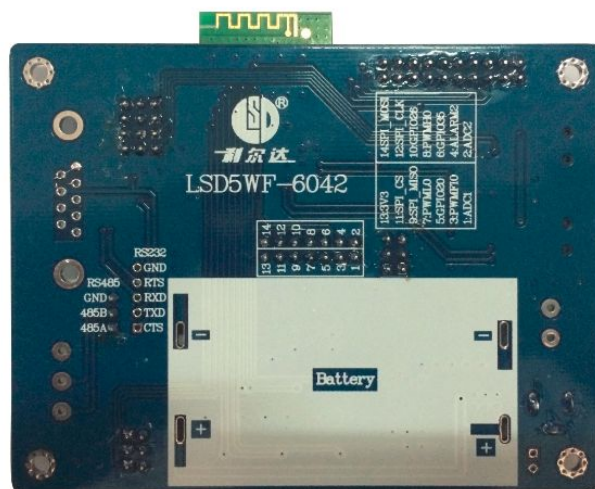
During specific design, users can consult the Lierda technical engineer to assist in the place of the module and related Layout.

8. Developing tool

Lierda would provide a complete set of LSD4WF-2MD05101 development kit for customers to get familiar with the application and development of the module. Users can configure and debug the parameters of the LSD4WF-2MD05101 module through the USB interface and the function test. This development board can directly get power from the USB interface, it also support lithium battery and DC 5~18V DC current supply, convenient for the user.



Pic 1-6 Developing board (front)



Pic 1-7 Developing board (back)

External interface introduction, table: 1-4

Function	Item	Description
External interface	USB2TTL	UART to USB debugging port, can be used for power supply
	USB DEBUG	USB2.0 debugging interface(reserved)
	DC5-18V	5~18V DC input
	COM1	RS232 interface
	RS485	RS485 interface
	JMP1	Preserve
	JMP2	Preserve
	JMP3	4Pin USB and RS232 debugging choosing port, left choose USB
	JPM6	3Pin RS485 与 RS232 debugging choosing port, no wire jumper choose RS232
	EXT_PORT	LSD4WF-2MD05101 GPIO interface expand
	JTAG	JTAG data debugging interface
	Battery	Lithium battery supply interface
LED indication light	Power	3.3V power indication
	Sleep_ON	Module standby indication On: Module is in standby mode Off: Module is working
	nReady	Module start or updating ready indication On: Module started up Off: Module not started Blink: Remote updating, blink frequency in proportion to download speed
	nLink	Module connection indication On: Wi-Fi connected; Off: Wi-Fi unconnected;
Button	WPS	Function reserve
	nReset	Reset
	Sleep_RQ	Function reserve
	nReload	Press button for over 4 seconds to restore to factory settings.

Table 1-4 External interface introduction of LSD4WF-2MD05101developing board

(OEM) Integrator has to assure compliance of the entire end-product incl. the integrated RF Module. Additional measurements (15B) and/or equipment authorizations (e.g Verification) may need to be addressed depending on co-location or simultaneous transmission issues if applicable.

Integrator is reminded to assure that these installation instructions will not be made available to the end-user of the final host device.

With the low output power, this RF Module meets the FCC SAR exemption and can be therefore integrated into any (portable, mobile, fixed) host device.

The final host device, into which this RF Module is integrated" has to be labelled with an auxiliary label stating the FCC ID of the RF Module, such as "Contains FCC ID: N8NLS4WF".

Depending on the size of the final end-product, the §15.19 FCC statement "This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation."

should be placed also on the device or alternatively within a prominent location of the users manual

The §15.21 "Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment." statement has to be included in a prominent location of the users manual

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.