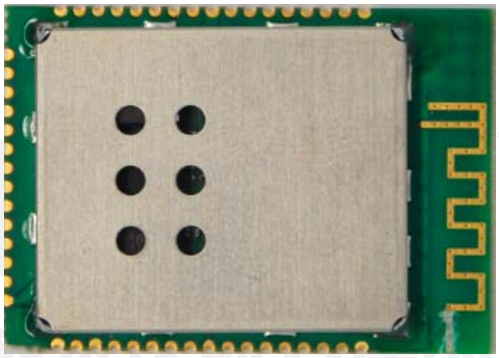
# Lierda Science & Technology Ltd

LSD SCIENCE & TECHNOLOGY CO., LTD.

# LSD4WF-2MD05106(XXXY)
# Low Power Wi-Fi Module User Manual



**Model ：LSD4WF-2MD05106**

**Name ：Wi-Fi Module**

**Revision ：v1.0**

# Index





OEM Labeling Requirements:

NOTICE:The OEM or final integrator must ensure that FCC labeling requirements are met.This includes an additional label on the outside of the final product housing with the following contents:

Company Name:XXXX

MODEL: YYYY

Contains Model:LSD4WF-2MD05106(XXXXY)  FCC ID:N8NLSD4WF2MD05106

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.

To satisfy FCC RF Exposure requirements for this transmission devices, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during operation. To ensure compliance, operation at closer than this distance is not recommended. The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

# 1. Product overview

## 1.1 General Description

LSD4WF-2MD05106 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 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

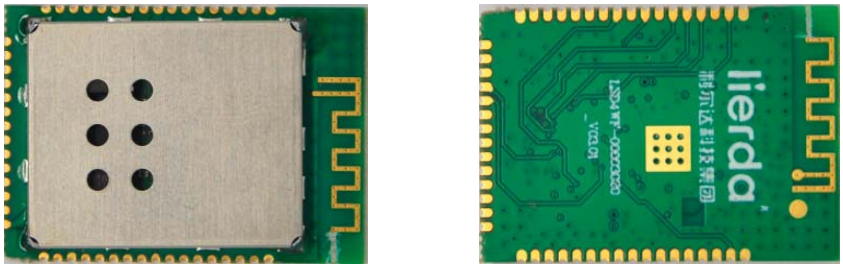
- Confirm with 802.11b/g/n protocol.
- Built-in high performance M3 core MCU, highest frequency 166MHz, high speed data processing ability.
- USART/GPIO/SPI/PWM multiple interface.
- QJoine high speed link configuration.
- Support STA/AP/STA+AP coexist work mode.
- Support WPA/WPA2/WEP encryption.
- 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

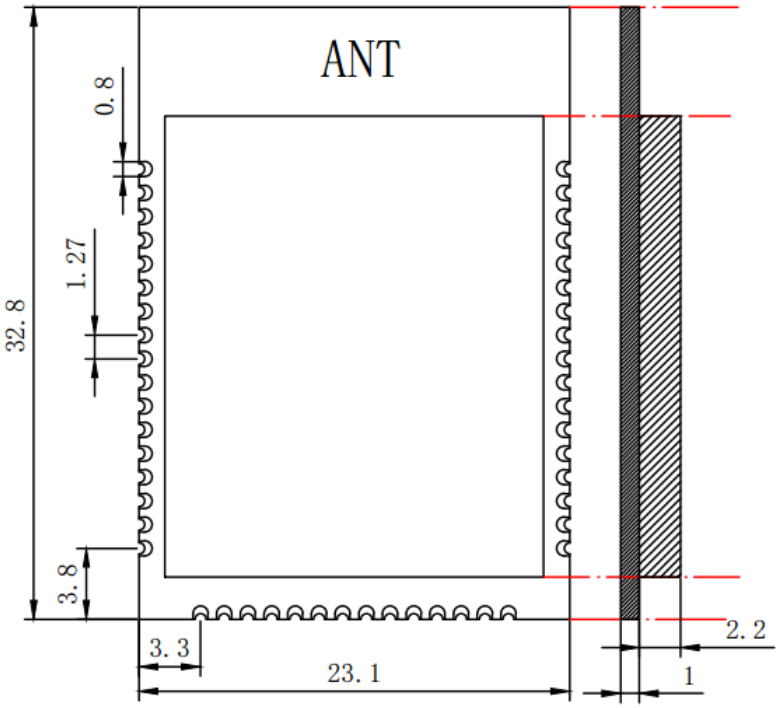
| | Parameters | |
|---|---|---|
| Wireless Parameters | Standard | 802.11 b/g/n |
| | Frequency | 2.412GHz-2.462GHz |
| | Emitting power | 802.11b:+17.0±0.5dBm(@11Mbps) |
| | | 802.11g:+15.5±0.5dBm(@54Mbps) |
| | | 802.11n:+15.5±0.5dBm(@HT20,MCS7) |
| | Receiving Sensitivity | 802.11b: -83 dBm (@1Mbps ,CCK) |
| | | 802.11g: -74dBm (@54Mbps, OFDM) |
| | | 802.11n: -61dBm (@HT20, MCS7) |
| | **Type of Modulation** | 802.11g/n OFDM(BPSK,QPSK,16QAM,64QAM)<br>802.11bCCK11Mbps,5.5Mbps,QPSK2Mbps,BPSK 1Mbps |
| | Antenna | Built-in：On board PCB antenna 2dBi |
| Hardware Parameters | Working Voltage | 3.3V（3.0V~3.6V） |
| | Working Current | Quiescent Current：~20mA<br>Emitting peak Current：~200mA |
| | Working Temperature | -20℃~ 85℃ |
| | Hardware Interface | USART/GPIO/SPI/PWM |
| | Dimension | 32.8mmx23.1mmx3.2mm |
| Software parameters | Wireless network type | STA/AP/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-2MD05106 Basic Parameters

# 3. Package



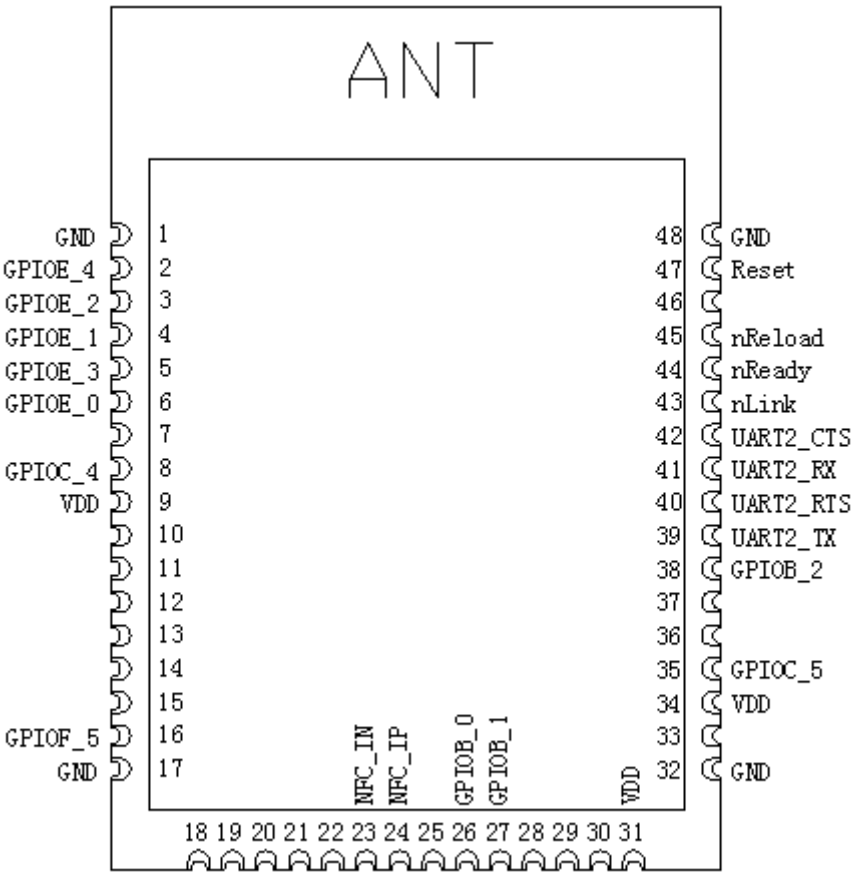

Pic 1-2 LSD4WF-2MD05106 Front and back




Unit：mm

Pic 1-3 LSD4WF-2MD05106 module package dimension

# 4. Pin definition




Pic 1-4 LSD4WF-2MD05106 Module pin layout

| PIN | Pin Definition | Function |
|---|---|---|
| 1 | GND | Ground pin |
| 2 | JTAG_CLK/GPIOE_4 | Program download port |
| 3 | JTAG_TDO/PWM2/SPIO_MOSI/GPIOE_2 | Program download port |
| 4 | JTAG_TDI/PWM1/SPIO_CLK/GPIOE_1 | Program download port |
| 5 | JTAG_TMS/PWM3/SPIO_MISO/GPIOE_3 | Program download port |
| 6 | PWM0/SPIO_CS0/GPIOE_1 | Multiplex pin |
| 7 | **NC** | **NC** |
| 8 | GPIOC_4 | **GPIO** |
| 9 | VDD | **VCC（DC_3.3V）** |
| 10 | NC | **NC** |
| 11 | NC | **NC** |
| 12 | NC | **NC** |
| 13 | NC | **NC** |
| 14 | NC | **NC** |
| 15 | NC | **NC** |

| | | |
|---|---|---|
| 16 | GPIOF_5 | EEPROM_SEL<br>0:Internal NV memory select<br>1:External EEPROM select<br>Define：pull-down |
| 17 | GND | Ground pin |
| 18 | NC | NC |
| 19 | NC | NC |
| 20 | NC | NC |
| 21 | NC | NC |
| 22 | NC | NC |
| 23 | NFC_IN | NFC+ |
| 24 | NFC_IP | NFC- |
| 25 | NC | NC |
| 26 | GPIOB_0 | BOOT_SCENARIO<br>0:booting from internal memory<br>1:booting flash<br>Define: pull-down |
| 27 | GPIOB_1 | GPIO |
| 28 | NC | NC |
| 29 | NC | NC |
| 30 | NC | NC |
| 31 | VDD | VCC（DC_3.3V） |
| 32 | GND | Ground pin |
| 33 | NC | NC |
| 34 | VDD | VCC（DC_3.3V） |
| 35 | GPIOC_5 | GPIO |
| 36 | NC | NC |
| 37 | NC | NC |
| 38 | GPIOB_2 | NORMAL_MODE_SEL<br>0:Normal operation mode<br>1:Enter into debug mode<br>Define：pull-down |
| 39 | UART2_TX/GPIOA_4 | UART2/IO PIN |
| 40 | UART2_RTS/GPIOA_2 | UART2/IO PIN |
| 41 | UART2_RX/GPIOA_0 | UART2/IO PIN |
| 42 | UART2_CTS/GPIOA_1 | UART2/IO PIN |
| 43 | GPIOA_5（nLink） | WIFI LED<br>“0” WIFI no Connection<br>“1”WIFI Connection |
| 44 | GPIOA_3（nReady） | Module startup instructions<br>“0: start<br>“1”no start |
| 45 | GPIOB_3（nReload） | Restore factory settings |

| | | |
|---|---|---|
| **46** | NC | **NC** |
| **47** | Reset | Reset pin |
| **48** | GND | Ground pin |

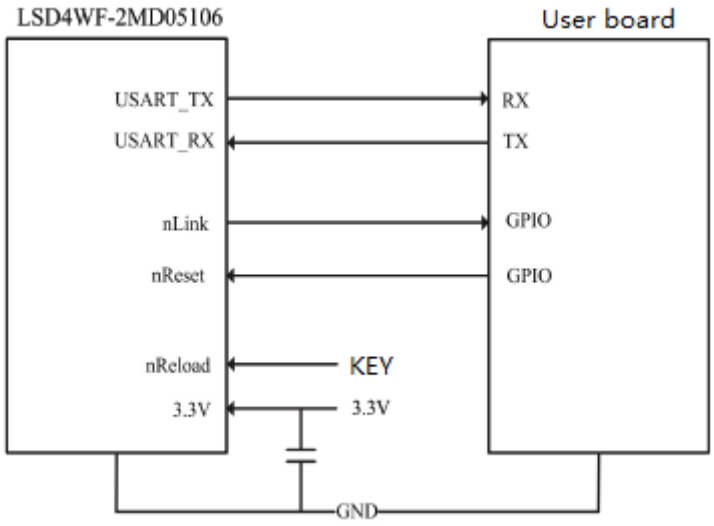
Table 1-1 LSD4WF-2MD05106 Module pin definition

# 5. Behavior of electricity

| Parameters | Minimum | Typical value | Maximum | Unit |
|---|---|---|---|---|
| Working voltage | 3.0 | 3.3 | 3.6 | V |
| Standby current | | 15 | | mA |
| Static current | | 26 | | mA |
| TX current | | 160 | | mA |
| RX current | | 65 | | mA |

Table1-2 LSD4WF-2MD05106 behavior of electricity

# 6. Typical application




Pic1-5 LSD4WF-2MD05106 Typical circuit connection

| Pin | State | Remark |
|---|---|---|
| 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 |
| nReset | Input, valid in low level | Reset pin |
| USART_TX/USART_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-2MD05106 module, users should using onboard antenna design need to be cautious that：

1, No components or GND on antenna area of user board

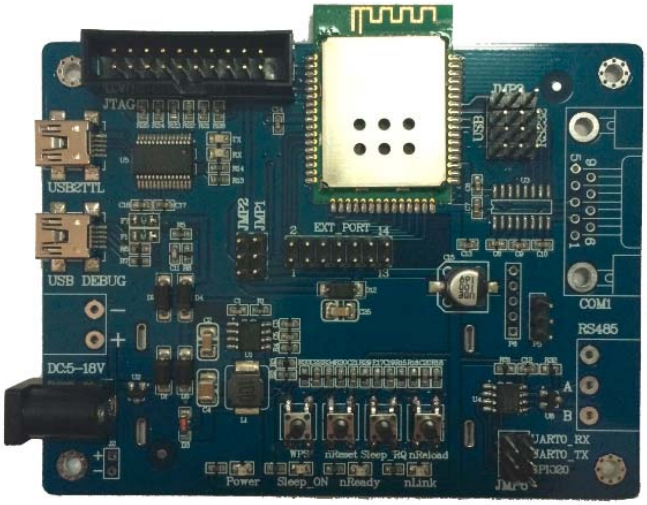
2, Keep antenna away from metal, stay over 10mm away from surrounding higher components.

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-2MD05106 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-2MD05106 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 and RS232 debugging choosing port, no wire jumper choose RS232 |
| | EXT_PORT | LSD4WF-2MD05106 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<br>On：Module is in standby mode<br>Off：Module is working |
| | nReady | Module start or updating ready indication<br>On：Module started up<br>Off：Module not started<br>Blink：Remote updating, blink frequency in proportion to download speed |

| | | |
|---|---|---|
| | nLink | Module connection indication<br>On：Wi-Fi connected；<br>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-2MD05106developing board