

Lierda Science & Technology Group Co., LTD

User's manual

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1 Product Overview

LSD4WF-3211I5SS is LSD Technology Co., Ltd. developed ultra-low-power embedded WiFi module, using the industry's lowest power, high-performance embedded processors WiFi network. Integrated hardware module within the MAC, radio transceiver unit, power amplification unit, developed for users to use M4 core units supports 802.11b / g / n protocol standards; LSD4WF-3211I5SS modular low-power WiFi module, can help customers achieve product upgrade wireless network communication to the basic serial communication.

1.1 Features

- Supports 802.11 b / g / n protocol standards, WPA / WPA2 encryption;
- support Smart configuration and AP key configuration;
- integrated TCP / IP protocol stack, reducing the programming burden;
- contain Cortex M4 core, friendly development environment;
- Simply link provide network programming library and M4 core driver library;
- provide a rich peripheral interfaces, UART / SPI / I2C / I2S / PWM, etc.
- low power consumption, HIB, the operating current 4ua;
- Under LPDS mode, the operating current 2ma;
- ultra-small size of 23 * 32mm, surface mount package;
- Easy to use IAR / CCS compiler environment;

1.2 Parameters

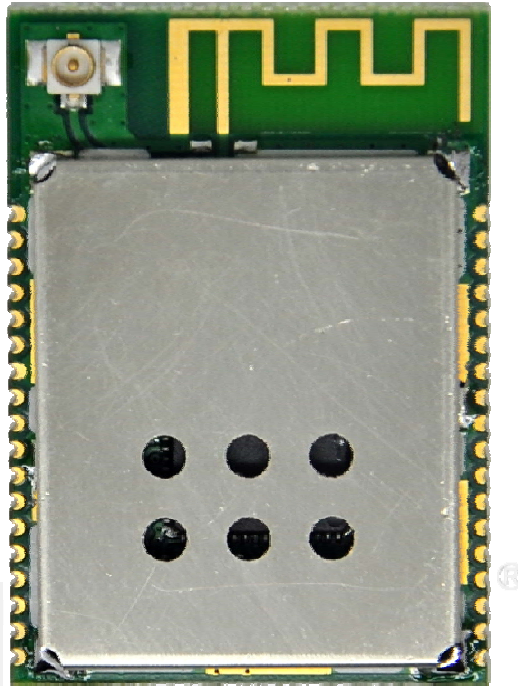
- optional external interface UART / SPI / I2C / I2S
- own internal network MAC
- network protocol standard 802.11 b / g / n 20
- 2.4G network operating frequency
- transmit power: 802.11b: 15dBm +/- 1.5dB
802.11g: 11dBm +/- 1.5dB
802.11n 20: 10dBm +/- 1.5dB
- Receiving sensitivity: 802.11b -94.5dbm (8% PER)
802.11g -73dbm (10% PER 54M@OFDM)
802.11n -70dbm (10% PER MCS7)
- Under current--HIB mode: 4ua;
- Under current--Idle Connect mode: 2ma (DITM = 1);
- hardware encryption: WEP, WPA, WPA2;
- antenna configurations: on-board PCB antenna and external antenna on board;
- module pin count: 48pin;
- module size: 23.1 * 32.8mm;

1.3 Applications

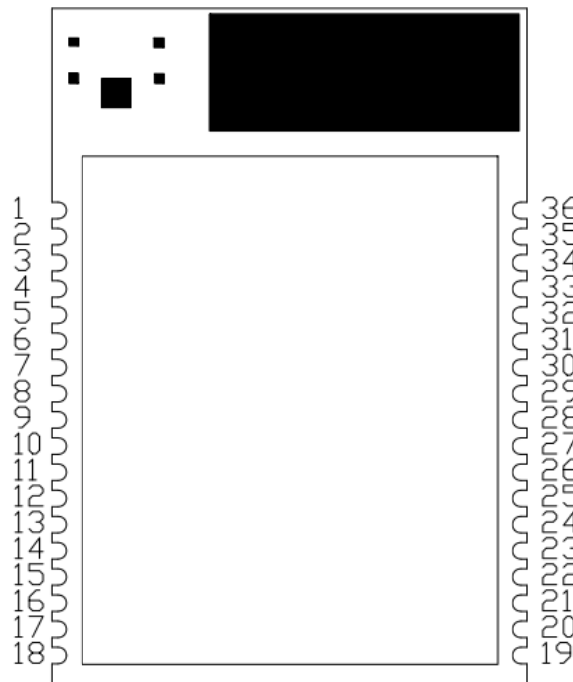
- ☐ Smart Home Applications
- ☐ white goods
- ☐ handheld network devices
- ☐ wireless networking applications
- ☐ remote equipment monitoring

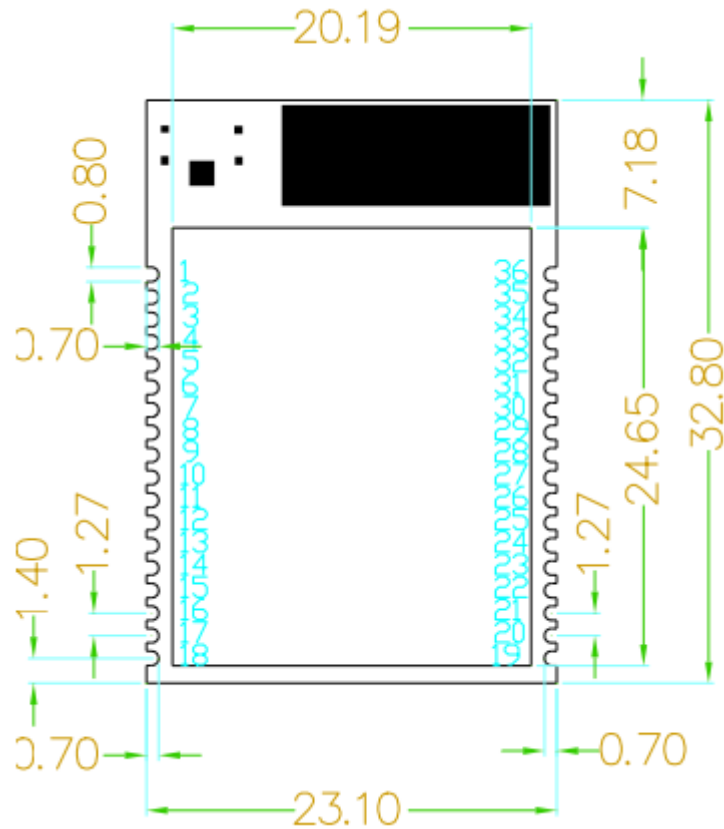
2 Hardware Overview

2.1 Appearance



2.2 Product structure size





2.3 Distribution Pin Description

NO.	Network label	Distribution	Remark
1	GND	GND	
2	EXRESET	The external reset pin	
3	SOP2	Sense-On-Power 2	
4	SOP0	Sense-On-Power 0	
5	VDD	3.3V	
6	VDD	3.3V	
7	GND	GND	
8	GND	GND	
9	GPIO30	General-Purposes/O	
		UART0 TX Data	
		I2S Audio PortClock O	
		I2S Audio PortFrame Sync	
		Timer CapturePort	
		General SPIMISO	
10	GPIO0	General-Purposes/O	
		UART0 Clear ToSend Input	
		I2S Audio PortData 1 (RX/TX)	

			Timer CapturePort	
			General SPI ChipPort	
			General SPI ChipSelect	
			UART1 RequestTo Send O	
			UART0 RequestTo Send O	
			I2S Audio PortData 0 (RX/TX)	
11	GPIO6		General-PurposeI/O	
			UART0 RequestTo Send O	
			Parallel CameraData Bit 0	
			UART1 Clear ToSend Input	
			UART0 Clear ToSend Input	
			Timer Capture Port	
12	GPIO1		General-Purpose I/O	
			UART0 TX Data	
			Pixel Clock FromParallel CameraSensor	
			UART1 TX Data	
			Timer CapturePort	
13	GPIO2		General-Purpose I/O	
			UART0 RX Data	
			UART1 RX Data	
			Timer CapturePort2	
			ADC Channel 0Input (1.5V max)	
14	GPIO3		General-Purpose I/O	
			Parallel CameraData Bit 3	
			UART1 TX Data	
			ADC Channel 1Input (1.5V max)	
15	GPIO4		General-Purpose I/O	
			UART1 RX Data	
			Parallel CameraData Bit 2	
			ADC Channel 2 Input (1.5V max)	
16	GPIO5		General-Purpose I/O	
			Parallel CameraData Bit 1	
			I2S Audio PortData 1 (RX/TX)	

			Timer CapturePort 5	
			ADC Channel 3 Input (1.5V max)	
17	GPIO7		General-Purpose I/O	
			UART1 RequestTo Send O	
			UART0 RequestTo Send O	
			UART0 TX Data	
			I2S Audio PortClock O	
18	GPIO8		General-Purpose I/O	
			Interrupt from SDCard (Futuresupport)	
			I2S Audio PortFrame Sync	
			Timer Capture Port 6	
19	GPIO9		General-Purpose I/O	
			Pulse WidthModulated05	
			SD Cad Data	
			I2S Audio PortData (Rx/Tx)	
			Timer CapturePort 0	
20	GPIO10		General-Purpose I/O	
			I2C Clock	
			Pulse-WidthModulated06	
			UART1 TX Data	
			SD Card Clock	
			Timer CapturePort 1	
21	GPIO11		General-Purpose I/O	
			I2C Data	
			Pulse-WidthModulated07	
			Free Clock ToParallel Camera	
			SD CardCommand Line	
			UART RX Data	
			Timer Capture Port2	
			I2S Audio PortFrame Sync	
22	GPIO12		General-Purpose I/O	
			I2S Audio PortClock O	
			Parallel CameraVertical Sync	
			I2C Clock	
			UART0 TX Data	
			Timer CapturePort 3	
23	GPIO13		General-Purpose I/O	

		I2C Data	
		Parallel CameraHorizontal Sync	
		UART0 RX Data	
		Timer CapturePort 4	
24	GPIO14	General-Purpose I/O	
		I2C Clock	
		General SPIClock	
		Parallel CameraData Bit 4	
		Timer CapturePort 5	
25	GPIO15	General-Purpose I/O	
		General SPIMISO	
		I2C Data	
		Parallel CameraData Bit 5	
		Timer CapturePort 6	
26	GPIO16	General-Purpose I/O	
		General SPIMOSI	
		Parallel CameraData Bit 6	
		UART1 TX Data	
		Timer CapturePort 7	
27	GPIO17	General-Purpose I/O	
		UART1 RX Data	
		General SPI ChipSelect	
		Parallel CameraData Bit 7	
28	GND	GND	
29	VCC	3.3V	
30	GPIO22	General-Purpose I/O	
		I2S Audio PortFrame Sync	
		Timer Capture Port 4	
31	GPIO28	General-Purpose I/O	
32	JTAG_TDI	JTAG TDI	
33	JTAG_TDO	JTAG TDO	
34	JTAG_TCK	JTAG TCK	
35	JTAG_TMS	JTAG TMS	
36	GND	GND	

3 Functional Description

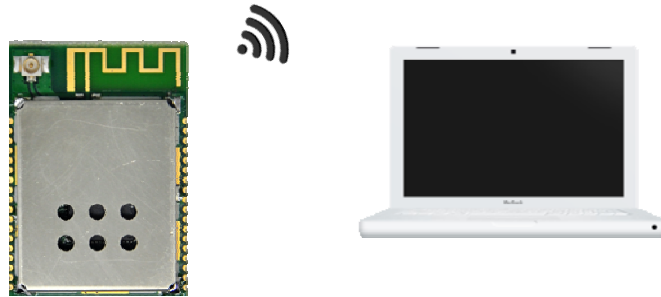
3.1 Networking features

LSD4WF-3211I5S module can be configured to AP mode and STA mode, at the same time have a wireless network interface, but also includes some common wired interface methods, such as SPI interface, I2C interface, I2S interface, UART interface; the presence of these interfaces greatly expanded connection module, but also to enable

a user to more quickly and modules for docking, to achieve data transmission network;

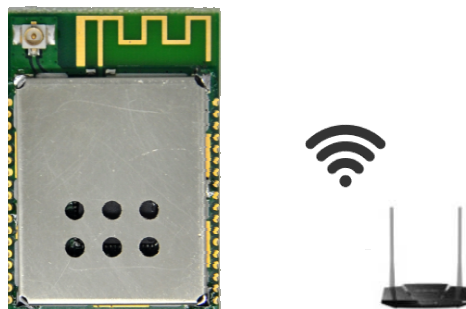
3.1.1 AP Networking

AP the wireless access point is the center of a network; Generally, the router as AP, under certain circumstances, also some mobile phone terminals, PAD as AP; LSD4WF module can also be used as AP mode, for receiving the network. Connections as shown below:



3.1.2 AP Networking

STA is the wireless station, a wireless network terminal, typically to access the AP, the AP transmits data to the network via; LSD4WF as the next STA mode, can be connected with any of the AP, the wireless Internet module to achieve.



3.2 Passthrough mode

LSD4WF supports serial transparent transmission mode, data from the serial transmission cable to transmit a wireless network; transparent transmission mode, so that the customer's products to the fastest and easiest way to implement the network. Users need only a simple configuration via the serial port can be networked and data transmission;

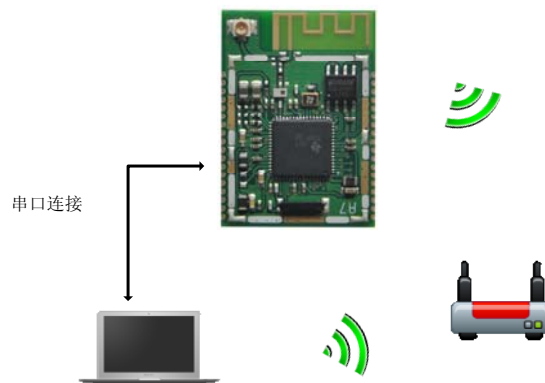
4 Instructions for use

WiFi module when using then need to use two software;

- 1, SecureCRT serial debugging tools;
- 2, TCP Socket communication tools;

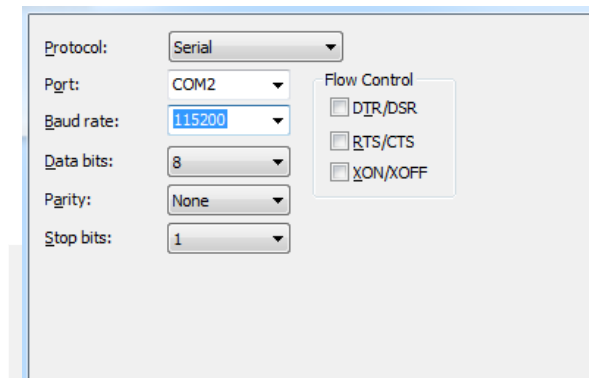
4.1 Network Connection

Configuration module in STA mode, and let the router connection; computer and router connection; module and a computer via a serial connection;



4.1.1 Serial Port Configuration

Open serial debugging assistant, a baud rate of 115200, 1 stop bit, no parity, as follows:



Press the reset button module, wait for some time, after the initialization is complete, you can receive AT command input;

Enter AT + WKEY = AT + WKEY = WPAPSK, AES, lierda18f <CR>, return + ok, which WPAPSK security type, AES data encryption, lierda18f secret key for encryption;

Enter AT + WSSID = Lierda18f <CR>, return + ok;

4.2 Creating Socket

4.2.1 Creating a Socket A

Open socket tool, select the server mode, TCP address is 192.168.1.145, port number 5001, click the TCP listener, configured as follows:

Serial port, enter AT + NETP = TCP, CLIENT, 5001,192.168.1.145 <CR>,return+ ok;

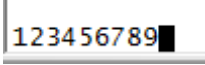
EnterAT + TCPDIS = on <CR>,return+ ok;

In sokit tool, a message appears as follows:

Appear[TCP] 192.168.1.121:64191 expressed socket created successfully;

Click to select[TCP] 192.168.1.121:64191, then fill in the sending area as sokit tool data needs to be sent, and click Send, receives serial data sent successfully, as follows:

Serial data obtained are as follows:



4.2.2 Creating a Socket B

Open sokit tool again, choose server mode, TCP address is 192.168.1.145, the port is set to 5002, click the TCP listener, as follows:

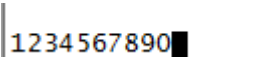
Serial port, enter AT + SOCKB = TCP, 5002,192.168.1.145 <CR>,return+ ok

Enter AT+TCPDISB=on<CR>, return +ok;

Information shown below appears in sokit tool, indicates socket B created successfully, as follows:

And create the first Socket Communications as an areato fill in the data transmitted by the data, such as 1234567890, click send, receive data appear in the serial, as follows:

The serial data is as follows:

A screenshot of a serial data display. It shows the text "1234567890" in a monospaced font, with a cursor at the end of the string. The text is highlighted in blue.

4.2.3 Passthrough Mode

Enter the serial port of the AT + ENTM <CR>, so that the module enters the transparent mode.

5 Warning

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1)

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

To satisfy FCC RF Exposure requirements for this transmission device, 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.

The modular transmitter must be equipped with either a permanently affixed label or must be capable of electronically displaying its FCC identification number:

(A) If using a permanently affixed label, the modular transmitter must be labeled with its own FCC identification number, and, if the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains Transmitter Module FCC ID: N8NLS4WF-CC3221." Any similar wording that expresses the same meaning may be used. The Grantee may either provide such a label, an example of which must be included in the application for equipment authorization, or, must provide adequate instructions along with the module which explain this requirement. In the latter case, a copy of these instructions must be included in the application for equipment authorization