WK882H

User Manual

DISCLAIMER

The data contained in this manual are derived from laboratory testing by Guangdong Weila Intelligent Technology Co., Ltd. and are for reference purposes only. Actual results may vary.

Guangdong Weila Intelligent Technology Co., Ltd. assumes no responsibility or liability for any use of the information contained herein, including but not limited to any direct or indirect damages, infringements, or losses arising from such use. No warranties, either express or implied, are made with respect to the contents of this manual.

Guangdong Weila Intelligent Technology Co., Ltd. reserves the right to modify or update the contents of this manual at any time without prior notice, in accordance with product version changes and actual conditions.

All trademarks, registered trademarks, and other intellectual property rights referenced in this manual are the property of their respective owners. Unauthorized use of such intellectual property is strictly prohibited.

Guangdong Weila Intelligent Technology Co., Ltd. reserves the right of final interpretation of this manual.

Document Revision History

Version	Revision Description	Revised By	Date
V1.0	Initial Release	luo	2022/05/16
V1.1	Optimized RF specifications	luo	2024/03/24

Table of Contents

1. Product Overview

WK882H is a Wi-Fi + BLE dual-mode SMD module independently developed by Weikeng Technology. The module is available in multiple package sizes to match the dimensions of commonly used Wi-Fi modules on the market, achieving full Pin-to-Pin compatibility for easy hardware replacement and migration.

The module is based on the LN882H SoC, featuring an ARM® Cortex®-M4F core with clock frequencies of 40 MHz, 80 MHz, and 160 MHz. It supports RTOS operation and various low-power modes, making it suitable for a wide range of IoT applications.

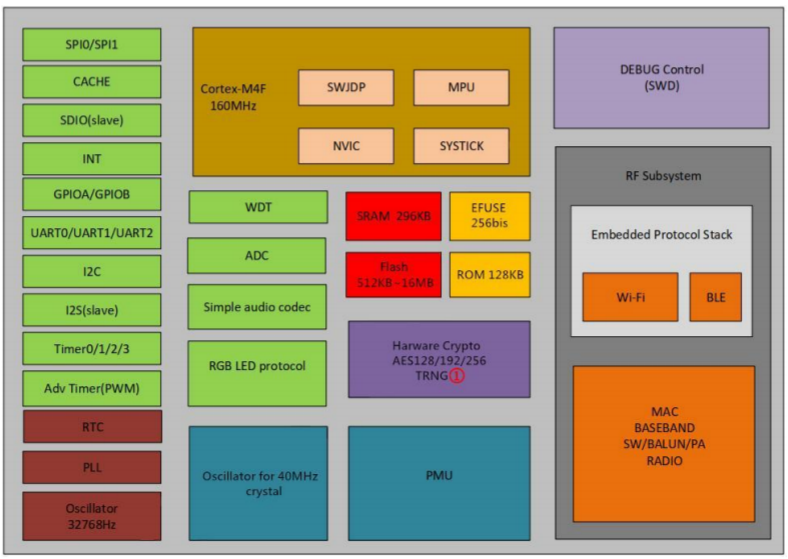
Wi-Fi Features:

The Wi-Fi function supports the standard 2.4 GHz IEEE 802.11 b/g/n protocol with a 20 MHz bandwidth. It supports STA, AP, and STA+AP operating modes, includes a complete TCP/IP protocol stack, and supports AT command operation.

BLE Features:

The BLE function supports the standard Bluetooth Low Energy (BLE) 5.1 protocol. It supports both Long Range transmission (125 Kbps, 500 Kbps) and High-Speed transmission (2 Mbps).

The block diagram of the chipset is shown below.



1.1 Features

- ●Wifi Features
  - o 2.4GHz 802.11 b/g/n, 20MHz bandwidth
  - o Support STA/AP/STA+AP operation modes
  - o SoC with on chip TCP/IP protocol stack
- ●BLE Features
  - o Bluetooth LE 5.1
  - o Support long range (125Kbps, 500Kbps) and high data rate (2Mbps)
- ●High Integration
  - o Integrated ARM© Cortex - M4F
  - o Integrated TR switch, balun, LNA, power amplifier and matching network
  - o AES-128\AES-192\AES-256 hardware encryption
  - o True random number generator
  - o 256 bits EFUSE
  - o CHKSUM accelerator to enhance TCP/UDP transfer
- ●Interface
  - o Single supply voltage with wide range supported (2.6~3.6V)
  - o SPI/I2S/I2C/SDIO/UART interface
  - o Timer/Advance Timer(PWM)
  - o Multi-channel ADC with programmed amplifier for voice sense
  - o XIP from external QSPI FLASH with high-speed cache
- ● Other general peripherals
  - o RTC
  - o WDT
  - o DMA controler
  - o high speed GPIOA/GPIOB
  - o RGB LED Protocol(Compatible with the WS2811)
- ● Low Power mode
  - o 80uA in deep sleep mode
  - o 10uA in retention mode
  - o 1uA in power down mode (en_chip=0)
- ●MCU
  - o 40/80/160M clock for Cortex-M4F
  - o 296KB RAM / 128kB ROM
  - o Up to 16MB Flash for XIP application code
  - o SWD debug interface

2. Electrical Characteristics

2.1 General Specifications

2.1.1 Absolute Maximum Ratings

Symbol	Min.	Max.	Unit
Supply Voltage	0	3.6	V
Logical Voltage	0.3*VIO	VDD33+0.3	V
Storage Temperature	-40	120	°C

2.1.2 Recommended Operating Conditions

Symbol	Symbol	Min.	Typ.	Max.	Unit
Power Supply	VDD33	2.6	3.3	3.6	V
VIO	VIOl/VIO2	2.6	3.3	3.6	V
Operating Temperature	-	-40	25	85	°C

2.1.3 Input/Output Terminal Characteristics

Characteristic	Min.	Typ.	Max.	Unit
Input low voltage VIL	-0.3	0	0.6	V
Input high voltage VIH	VIO-0.6	VIO	VIO+0.3	V
Output low voltage VOL	-0.45	0	0.45	V
Output high voltage VOH	VIO-.5	VIO	VIO+0.5	V

2.2 WiFi RF Specifications

2.2.1 Supported Frequencies

Parameter	Condition	Min.	Typ.	Max.	Unit
Receive frequency range 2.4GHz	-	2412	-	2484	MHz

2.2.2 Receiver Characteristics

Parameter	Condition	Min.	Typ.	Max.	Unit
Sensitivity					
11b, 1M	FER<8%, 1024 bytes		-94		dBm
11b, 11M	FER<8%, 1024 bytes		-87		dBm
11g, 6M	FER<10%, 1024 bytes		-90		dBm
11g, 54M	FER<10%, 1024 bytes		-74		dBm
11n, MCS0	FER<10%, 1024 bytes		-90		dBm
11n, MCS7	FER<10%, 1024 bytes		-71		dBm

Maximum input level					
11b	FER<8%, 1024 bytes		4		dBm
11g	FER<10%, 1024 bytes		-10		dBm
11n	FER<10%, 1024 bytes		-10		dBm
Operating power consumption					
11b			80		mA
11g			82		mA
11n			82		mA

2.2.3 Transmitter Characteristics

Parameter	Condition	Min.	Typ.	Max.	Unit
Output power					
11b, 1M DSSS	Maximum Burst power		18		dBm
11g, 54M OFDM	Maximum Burst power		16		dBm
11n, MCS7	Maximum Burst power		14		dBm
Power consumption					
11b	Continuous transmitting		320		mA
11g	Continuous transmitting		290		mA
11n	Continuous transmitting		270		mA

3. WK882H-B0-A Module

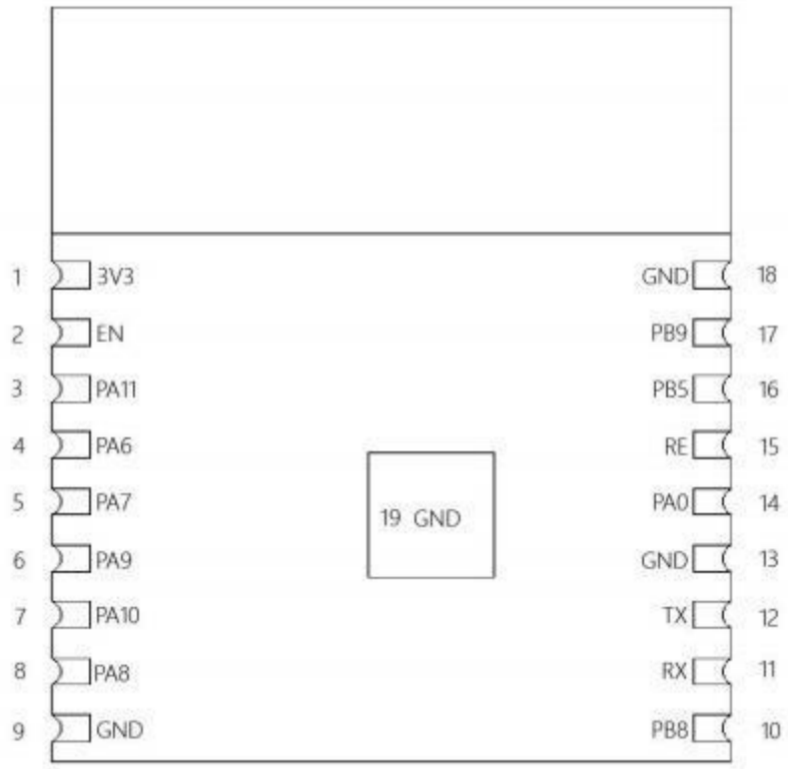
3.1 Module Introduction

The WK882H-B0-A is a Wi-Fi & BLE dual-mode module. It can be configured as a Wi-Fi module using AT commands to connect to Wi-Fi networks. Users can also develop custom applications through the SDK when using the module as a standalone Wi-Fi module.

The BLE function requires users to develop their own applications using the SDK. The module supports an external SPI Flash, and the Flash capacity can be configured according to user requirements. By default, no SPI Flash is populated.

The module dimensions are 18 mm × 20 mm.

3.2 Pin Description



3.2.1 Pin Definition Table

No.	Pin Name	Pin Type	Description
1	3V3	POWER	3.3V power supply
2	EN	I	Chip enable pin, active high
3	PA11	I/O	SDIO_IO1/ EXT_INT11;
4	PA6	I/O	SDIO_IO2/ I2S_SDI/ EXT_INT6/ WAKEUP_INT5;
5	PA7	I/O	SDIO_IO3/ EXT_INT7/ WAKEUP_INT6;
6	PA9	I/O	SDIO_CLK/ I2S_CLK/ EXT_INT9/ BOOT1;
7	PA10	I/O	SDIO_IO0/ I2S_SDO/ EXT_INT10;
8	PA8	I/O	SDIO_CMD/ I2S_WS/ EXT_INT8/ BOOT0;
9	GND	POWER	Ground
10	PB8	I/O	PB8;

11	RX	I/O	UART RXD for debugging/program downloading
12	TX	I/O	UART TXD for debugging/program downloading
13	GND	POWER	Ground
14	PA0	I/O	ADC_CH2/ EXT_INT0/WAKEUP_INT0;
15	RE	I	Reset
16	PB5	I/O	ADC_CH7;
17	PB9	I/O	WAKEUP_INT7;
18	GND	POWER	Ground

3.2.2 I/O Multiplexing Description

All I/O pins listed above can be configured as any of the following multiplexed functions.

No.	Multiplexed Function	No.	Multiplexed Function	No.	Multiplexed Function
0	ISC0_SCL	12	TIMER_PWM2	24	PWM10
1	ISC0_SDA	13	TIMER_PWM3	25	PWM11
2	UART0_TX	14	PWM0	26	SPI0_SCK
3	UART0_RX	15	PWM1	27	SPI0_CS
4	UART0_RTS	16	PWM2	28	SPI0_MOSI
5	UART0_CTS	17	PWM3	29	SPI0_MISO
6	UART1_TX	18	PWM4	30	SPI1_SCK
7	UART1_RX	19	PWM5	31	SPI1_CS
8	UART2_TX	20	PWM6	32	SPI1_MOSI
9	UART2_RX	21	PWM7	33	SPI1_MISO
10	TIMER_PWM0	22	PWM8	34	RGB LED Protocol(WS2811_OUT)
11	TIMER_PWM1	23	PWM9		

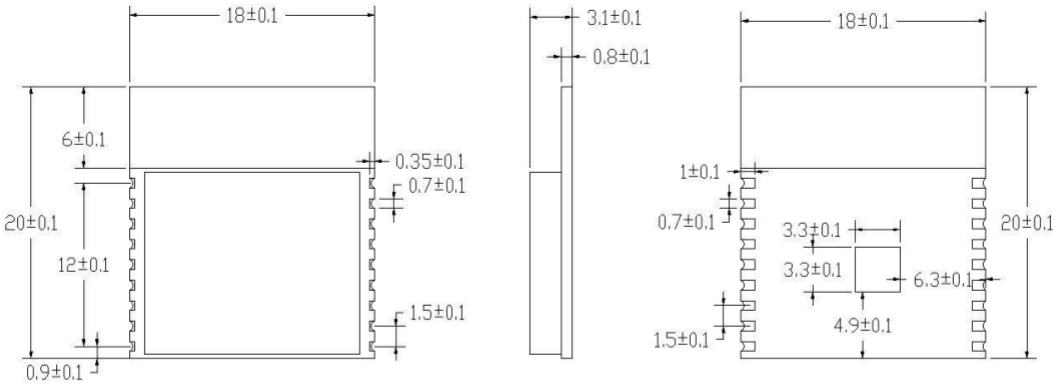
3.2.3 Boot Modes

During startup, the chip enters different boot modes depending on the status of the following pins.

Mode	PA8	PA9	Description
FLASH Boot	1	0	Default configuration: PA8 has an internal pull-down resistor; PA9 has an internal pull-up resistor.
	0	1	
UART Boot	0	0	UART firmware upgrade (download) mode.

3.3 Mechanical Dimensions

Unit: mm

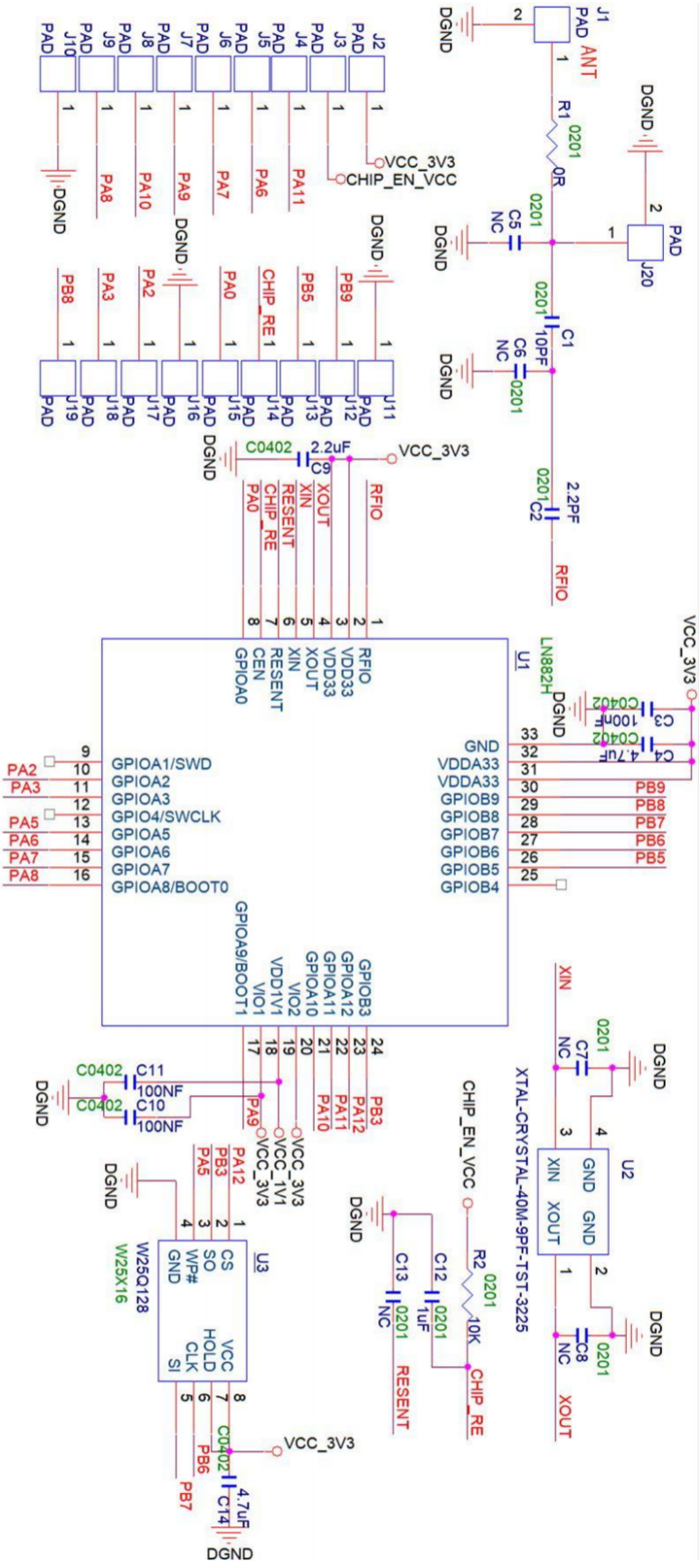


Top View　　Side View　　Bottom View

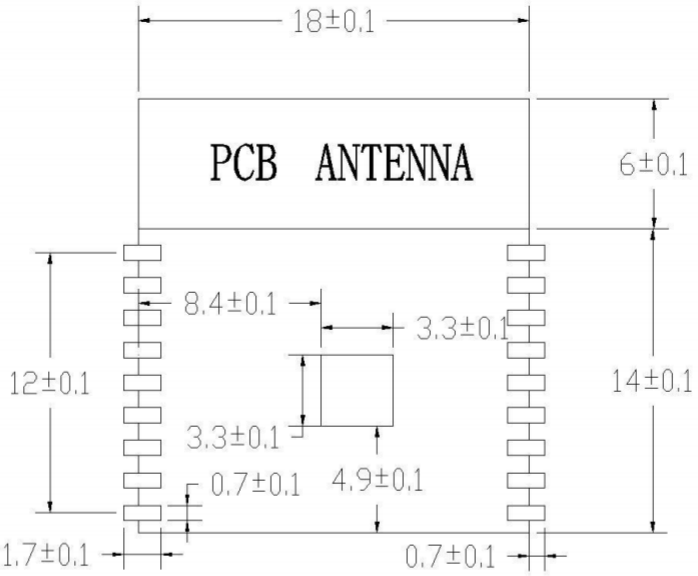
Front

Back

3.4 Reference Schematic

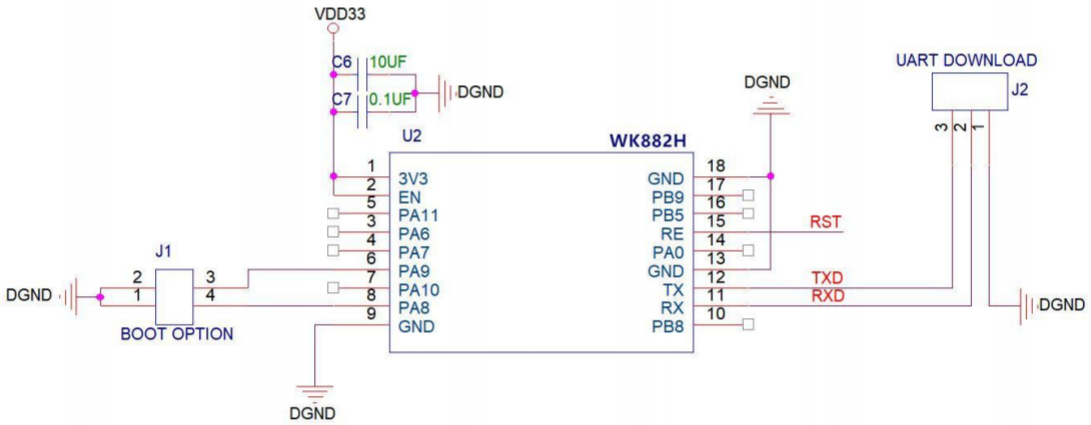


3.5 PCB Footprint



3.6 Design Guidelines

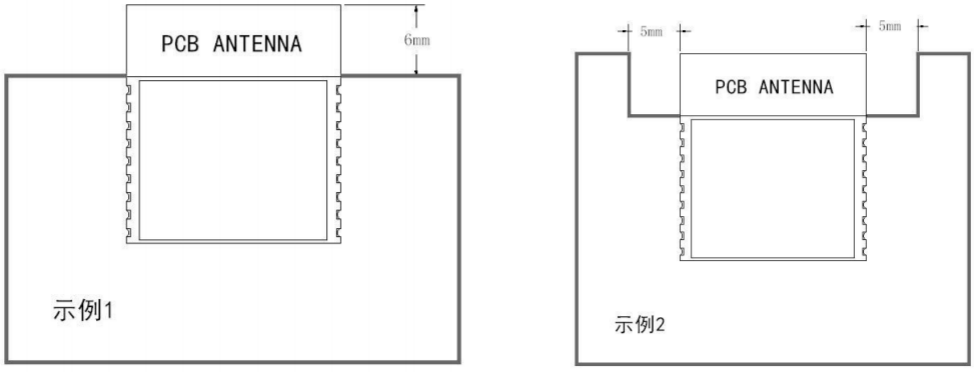
3.6.1 Reference Application Circuit



3.6.2 Antenna Placement Guidelines

To ensure optimal performance of the onboard antenna, metal components and high-frequency devices must not be placed near the antenna area.

For best RF performance, it is recommended to place the antenna according to either of the two example layouts shown below.



4. WK882H-B0-A Module

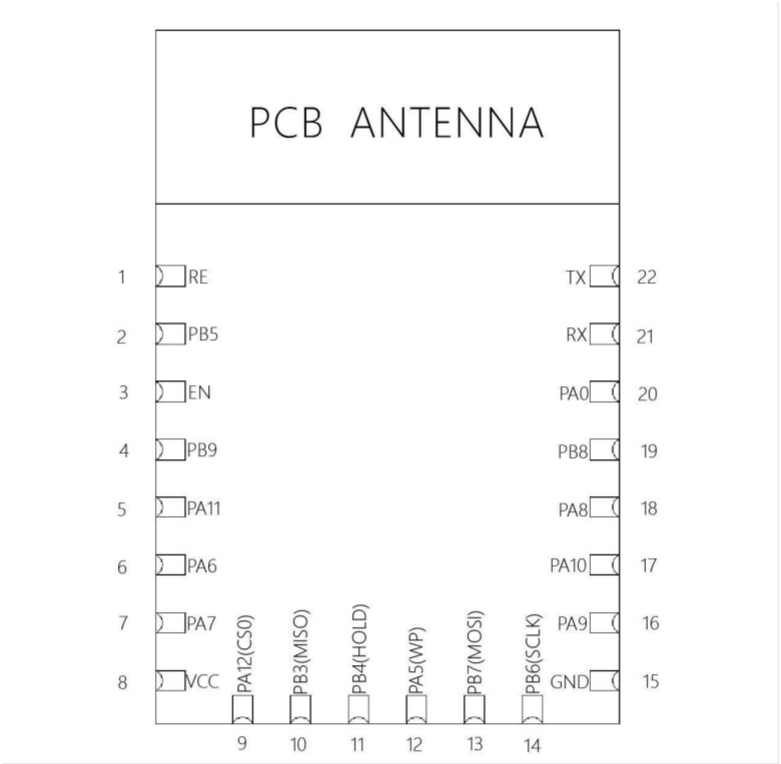
4.1 Module Introduction

The WK882H-B0-A is a Wi-Fi & BLE dual-mode module. It can be configured as a Wi-Fi module using AT commands to connect to Wi-Fi networks. Users can also develop custom applications through the SDK when using the module as a standalone Wi-Fi module.

The BLE function requires users to develop their own applications using the SDK. The module supports an external SPI Flash, and the Flash capacity can be configured according to user requirements. By default, no SPI Flash is populated.

The module dimensions are 16 mm × 24 mm.

4.2 Pin Description



4.2.1 Pin Definition Table

No.	Pin Name	Pin Type	Description
1	3V3	POWER	3.3V power supply
2	EN	I	Chip enable pin, active high
3	PA11	I/O	SDIO_IO1/ EXT_INT11;
4	PA6	I/O	SDIO_IO2/ I2S_SDI/ EXT_INT6/ WAKEUP_INT5;
5	PA7	I/O	SDIO_IO3/ EXT_INT7/ WAKEUP_INT6;
6	PA9	I/O	SDIO_CLK/ I2S_CLK/ EXT_INT9/ BOOT1;
7	PA10	I/O	SDIO_IO0/ I2S_SDO/ EXT_INT10;
8	PA8	I/O	SDIO_CMD/ I2S_WS/ EXT_INT8/ BOOT0;
9	GND	POWER	Ground
10	PB8	I/O	PB8;

11	RX	I/O	UART RXD for debugging/program downloading
12	TX	I/O	UART TXD for debugging/program downloading
13	GND	POWER	Ground
14	PA0	I/O	ADC_CH2/ EXT_INT0/WAKEUP_INT0;
15	RE	I	Reset
16	PB5	I/O	ADC_CH7;
17	PB9	I/O	WAKEUP_INT7;
18	GND	POWER	Ground

4.2.2 I/O Multiplexing Description

All I/O pins listed above can be configured as any of the following multiplexed functions.

No.	Multiplexed Function	No.	Multiplexed Function	No.	Multiplexed Function
0	ISC0_SCL	12	TIMER_PWM2	24	PWM10
1	ISC0_SDA	13	TIMER_PWM3	25	PWM11
2	UART0_TX	14	PWM0	26	SPI0_SCK
3	UART0_RX	15	PWM1	27	SPI0_CS
4	UART0_RTS	16	PWM2	28	SPI0_MOSI
5	UART0_CTS	17	PWM3	29	SPI0_MISO
6	UART1_TX	18	PWM4	30	SPI1_SCK
7	UART1_RX	19	PWM5	31	SPI1_CS
8	UART2_TX	20	PWM6	32	SPI1_MOSI
9	UART2_RX	21	PWM7	33	SPI1_MISO
10	TIMER_PWM0	22	PWM8	34	RGB LED Protocol(WS2811_OUT)
11	TIMER_PWM1	23	PWM9		

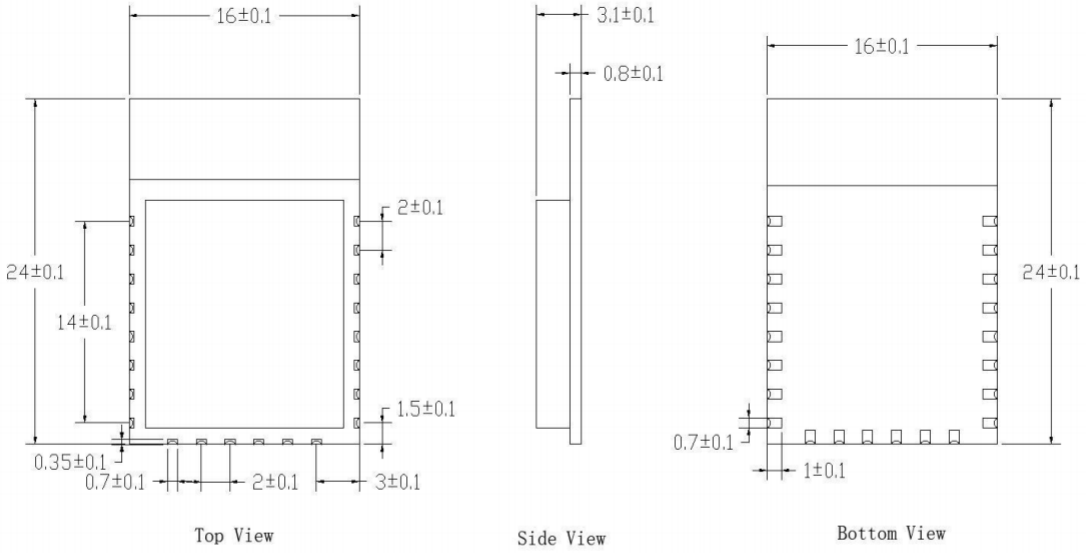
4.2.3 Boot Modes

During startup, the chip enters different boot modes depending on the status of the following pins.

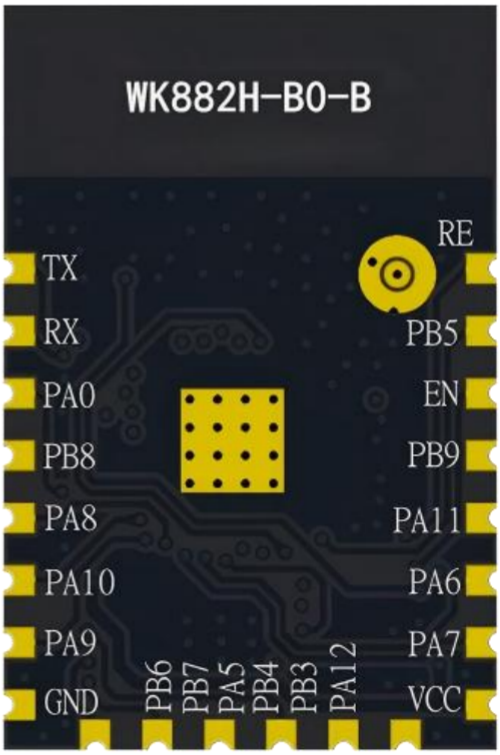
Mode	PA8	PA9	Description
FLASH Boot	1	0	Default configuration: PA8 has an internal pull-down resistor; PA9 has an internal pull-up resistor.
	0	1	
UART Boot	0	0	UART firmware upgrade (download) mode.

4.3 Mechanical Dimensions

Unit: mm

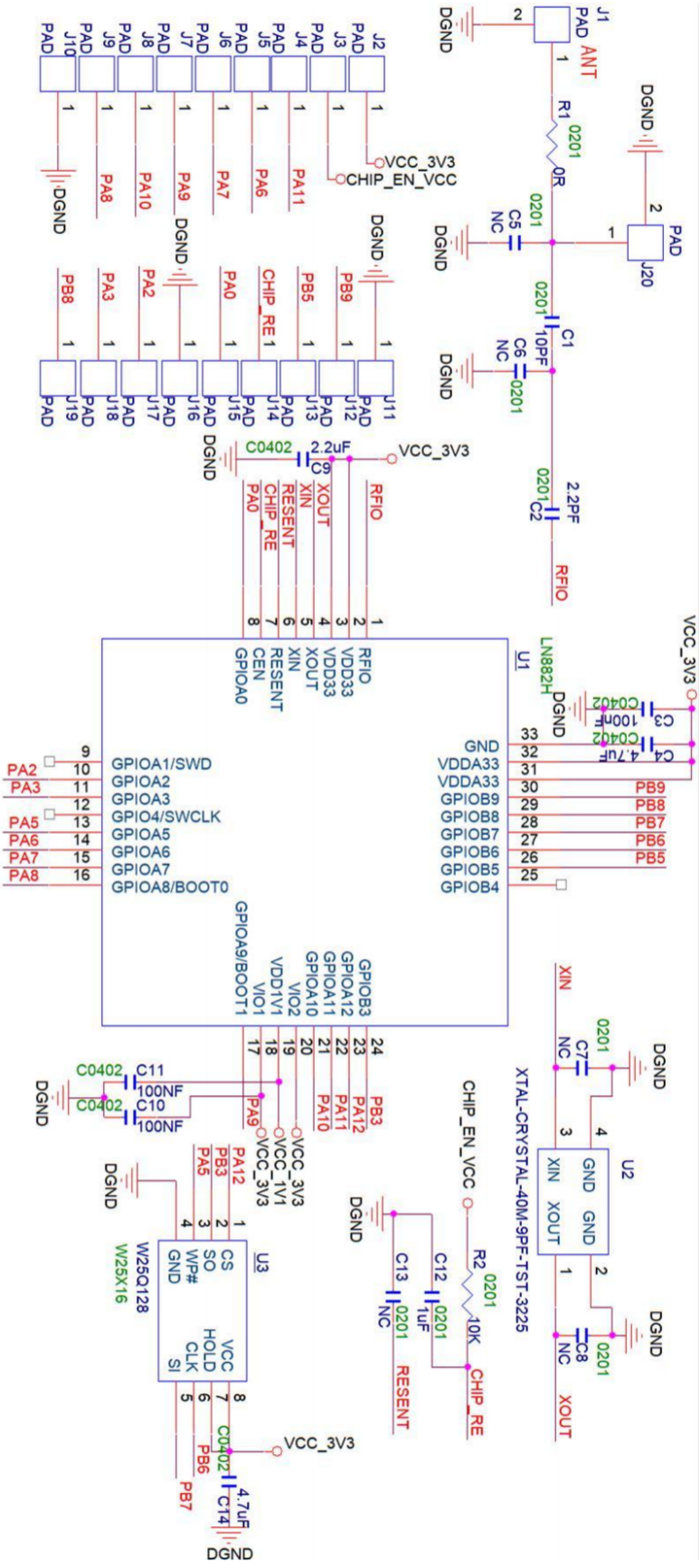


Front

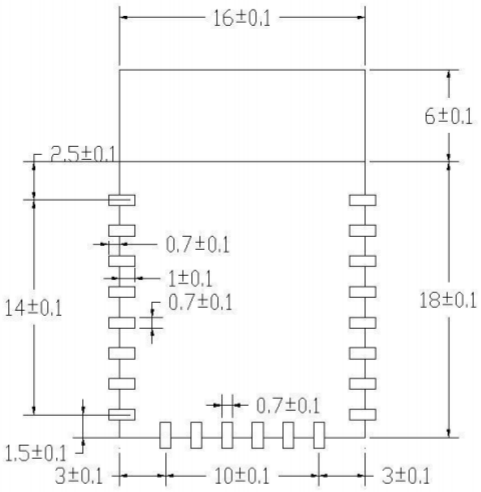


Back

4.4 Reference Schematic

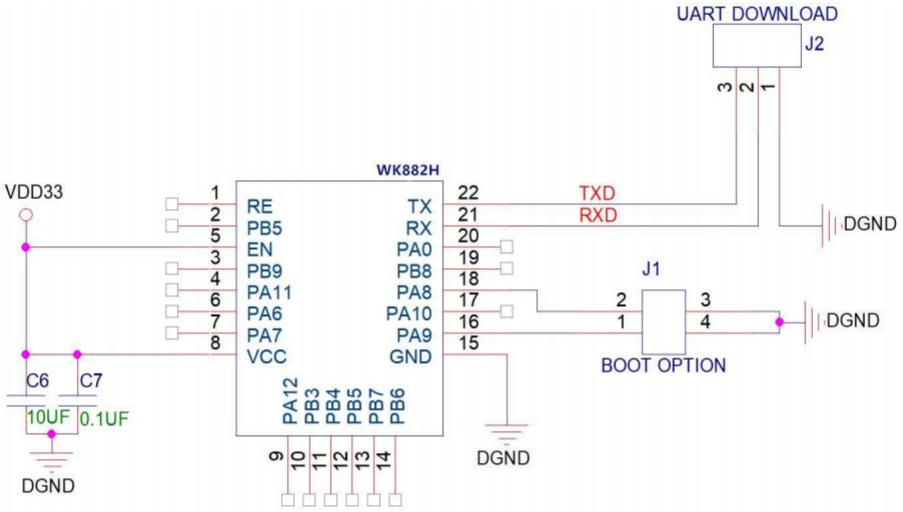


4.5 PCB Footprint



4.6 Design Guidelines

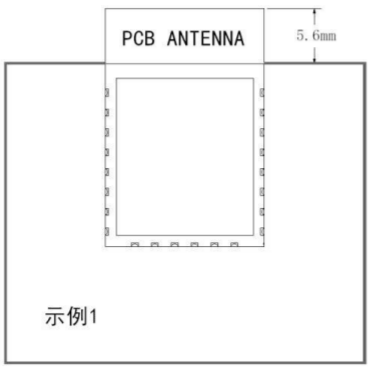
4.6.1 Reference Application Circuit

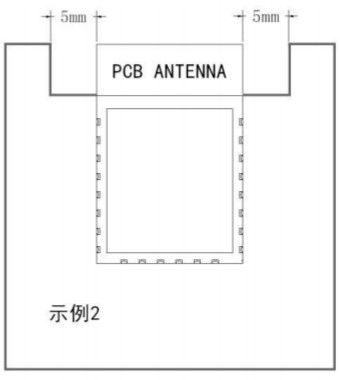


4.6.2 Antenna Placement Guidelines

To ensure optimal performance of the onboard antenna, metal components and high-frequency devices must not be placed near the antenna area.

For best RF performance, it is recommended to place the antenna according to either of the two example layouts shown below.





5. Contact Us

Company：Guangdong Weila Intelligent Technology Co., Ltd
TEL：13602688458（Mr. Zeng）
Email：sales@weikengtech.com

ADD：Floor 11, Block A, Building 9, Baoneng Science and Technology Park, Qingxiang Road, Longhua District, Shenzhen

6. References

1.《LN882H_Datasheet_v1.0 confidential.pdf》