Ai-WB3-12F-Kit Specification

Version V1.0.0

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Document resume

Version	Date	Develop/revise content	Edition	Approve
V1.0.0	2023.2.16	First Edition	JieWei	HongXu

Content

1. Product Overview

Ai-WB3-12F-Kit is a Wi-Fi&BLE development board developed by Shenzhen Anxinke Technology Co., LTD. The development board is equipped with LN882H chip as the core processor and supports Wi-Fi 802.11b/g/n and BLE 5.1 protocols. LN882H chip integration architecture (M4F kernel, dominant frequency up to 160 MHZ, built-in 296 KB SRAM, 128 KB ROM and rich peripheral interfaces, including the SDIO/SPI/UART/I2C/PWM/ADC/DMA/SWD/GPIO, etc. It can be widely used in the Internet of Things (IoT), mobile devices, wearable electronic devices, smart home and other fields.

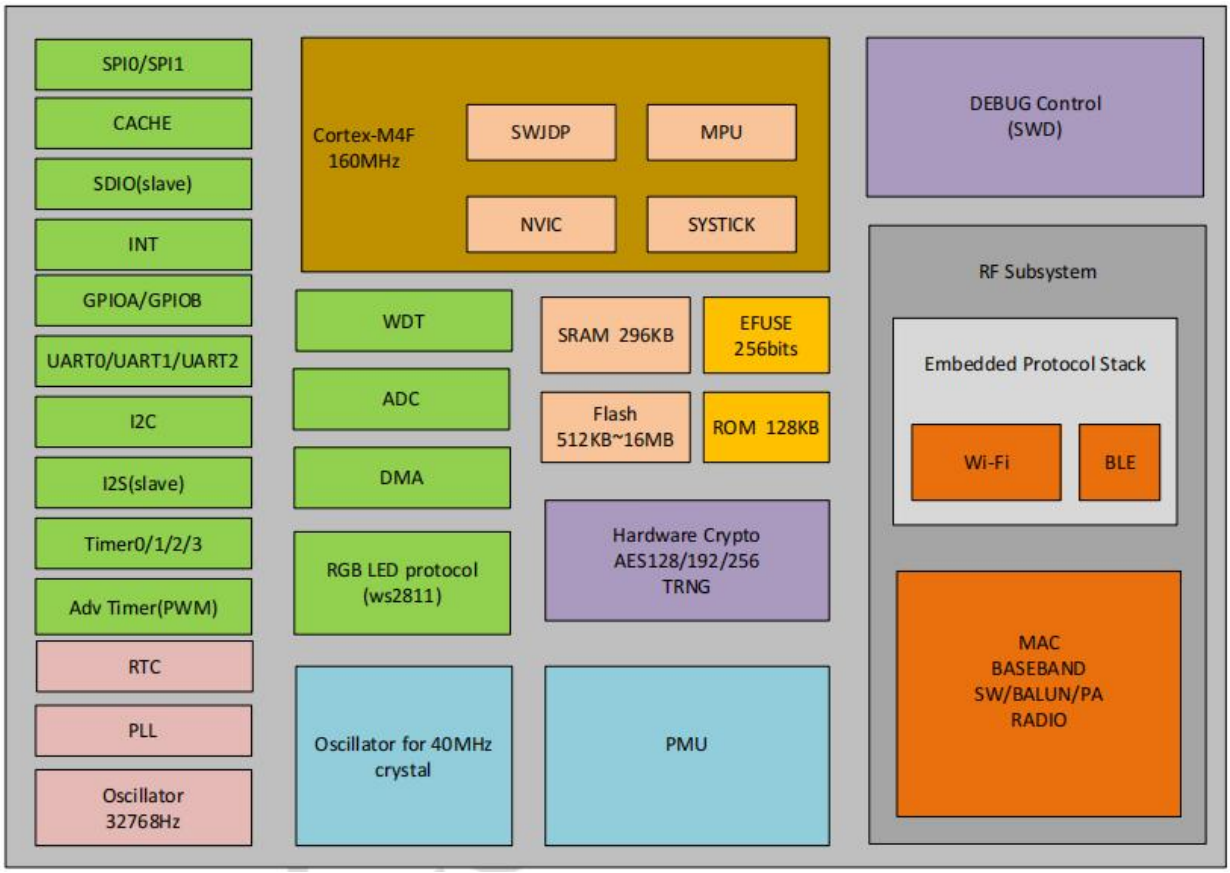


Figure 1 Main chip architecture diagram

1.1. Characteristic

- DIP-30 package
- Support IEEE 802.11 b/g/n protocol
- Support BLE5.1 protocol
- Support long range (125Kbps, 500Kbps) and high data rate (2Mbps)
- Support 296KB SRAM / 128KB ROM
- Support SDIO/SPI/UART/I2C/PWM/ADC/DMA/SWD/GPIO Interface
- Support for multi-channel ADC and programmable amplifiers for sound sensors
- Support RTC real-time clock and WDT watchdog
- Support true random number generator (TRNG)
- Support AES - 128\AES - 192\ AES - 256 hardware encryption
- Support 256 bits EFUSE
- Integration CHKSUM accelerator improve TCP/UDP transmission

2. Main parameters

Table 1 main parameters

Model	Ai-WB3-12F-Kit
Package	DIP-30
Size	48.26*25.40(±0.2)mm
Antenna	On-Board PCB antenna
Frequency	2400 ~ 2483.5MHz
Operation temperature	-40℃ ~ 85℃
Storage environment	-40℃ ~ 125℃ , < 90%RH
Power supply	Support voltage 3.3V or 5V, power supply current ≥500mA
Interfaces	SDIO/SPI/UART/I2C/PWM/ADC/DMA/SWD/GPIO
I/O	19
UART rate	Default 115200 bps
Security	AES-128\AES-192\AES-256 hardware encryption
Flash	Default:2MByte

2.1. Power supply selection

Ai-WB3-12F-Kit supports three power supply modes:

- Type-C interface power supply (recommended)
- 5V and GND pin power supply
- 3V3 and GND pin power supply

2.2. Static electricity requirements

Ai-WB3-12F-Kit is an electrostatic sensitive equipment, special precautions should be taken during handling.

Figure 2 ESD anti-static diagram

2.3. Electrical characteristics

Table 2 Electrical Characteristics Table

Parameter		Conditio	Min.	Typical value	Max.	Unit
Interface Power supply(Type-C)		VDD	4.5	5	5.3	V
Power supply voltage (pin)		VDD	2.7	3.3	3.6	V
I/O	VIL	-	-0.3	0	0.6	V
	VIH	-	VIO-0.6	VIO	VIO+0.3	V
	VOL	-	-0.45	0	0.45	V
	VOH	-	VIO-0.5	VIO	VIO+0.5	V
	VIL	-	-0.3	0	0.6	V

2.4. Wi-Fi RF performance

Table 3 Wi-Fi RF performance table

Description	Typical value			Unit
Spectrum Range	2400 - 2483.5			MHz
Output power				
Model	**Min.**	**Typical**	**Max.**	**Unit**
11n mode HT20, PA output power	-	14	-	dBm
11g mode, PA output power	-	16	-	dBm
11b mode, PA output power	-	18	-	dBm
Receiving sensitivity				
Model	**Min.**	**Typical**	**Max.**	**Unit**
11b, 1 Mbps	-	-95	-	dBm
11b, 11 Mbps	-	-88	-	dBm
11g, 6 Mbps	-	-91	-	dBm
11g, 54 Mbps	-	-74	-	dBm
11n, HT20 (MCS7)	-	-71	-	dBm

2.5. BLE RF performance

Table 4 BLE RF performance table

Description	Typical value			Unit
Spectrum Range	2400 ~ 2483.5MHz			MHz
Output power				
Rate Mode	**Min.**	**Typical**	**Max.**	**Unit**
1Mbps	-	12	-	dBm
Receiving sensitivity				
Rate Mode	**Min.**	**Typical**	**Max.**	**Unit**
1Mbps sensitivity @ 30.8% PER	-	-95	-	dBm

2.6. Power

The following power consumption data is based on a 3.3V power supply and an ambient temperature of 25° C.

- All POUT power of the emission model is in the measured value of the antenna interface.
- All emission data is based on 95% of the duty ratio, measured in continuous emission mode.

Table 5 Power Consumption Table

Model		Min.	AVG	Max.	Unit
Tx 802.11b，11Mbps，POUT=+18dBm		-	260	-	mA
Tx 802.11g， 54Mbps， POUT =+16dBm		-	235	-	mA
Tx 802.11n， MCS7， POUT =+14dBm		-	225	-	mA
Rx 802.11b, 1024 bytes long		-	90	-	mA
Rx 802.11g, 1024 bytes long		-	90	-	mA
Rx 802.11n, 1024 bytes long		-	90	-	mA
Sleep Mode	DTIM=1	-	11	-	mA
	DTIM=3	-	8	-	mA

3. Appearance size

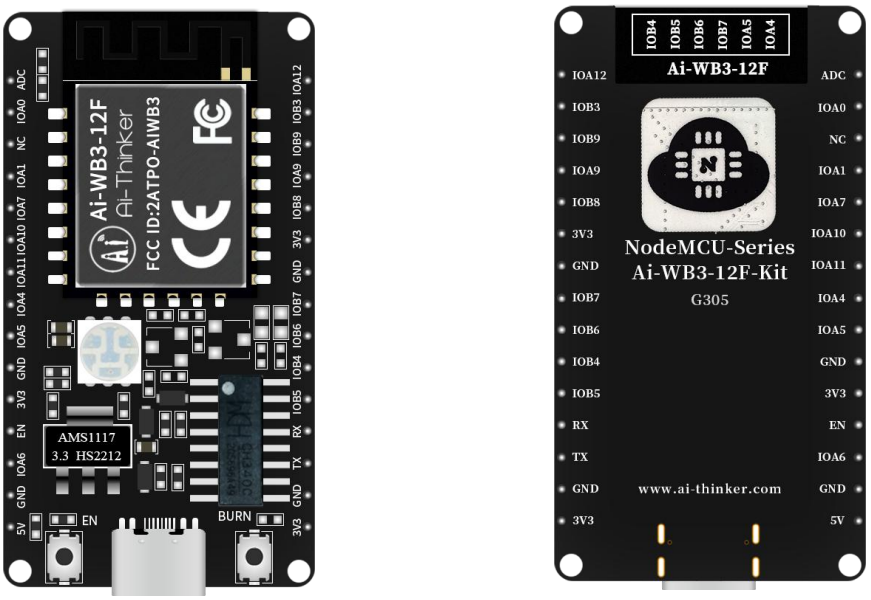


Figure 3 External view (For reference only)

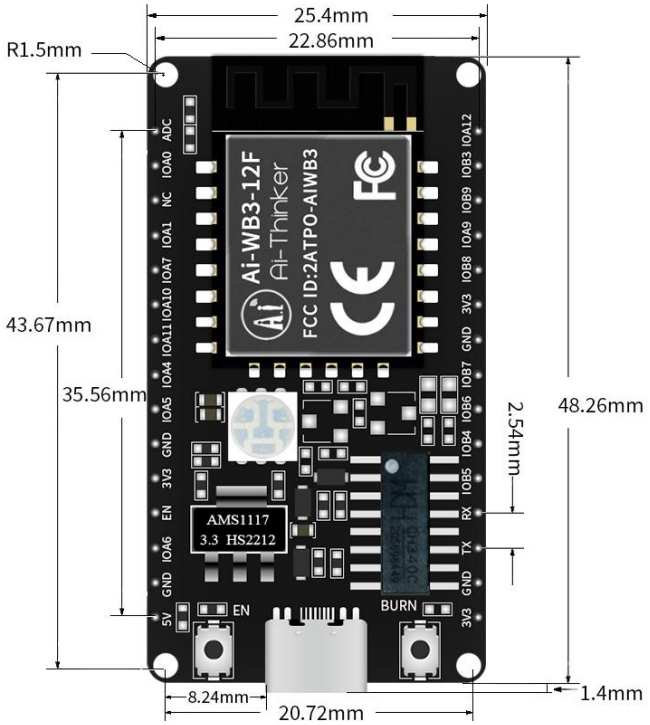


Figure 4 size chart

4. Indicator light and button description

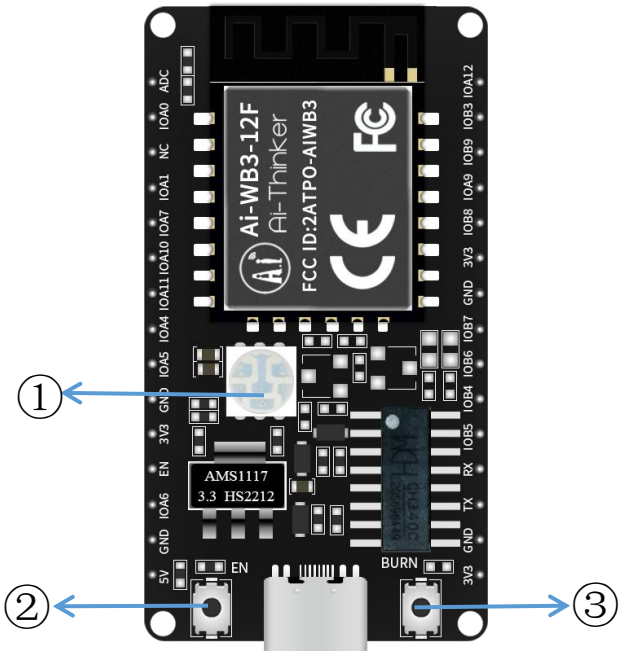


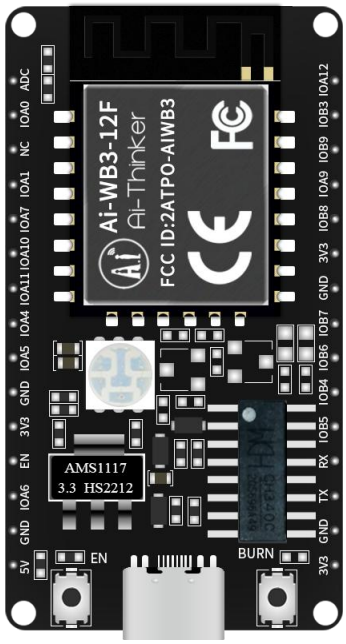
Figure 5 Ai-WB3-12F-Kit indicator light and key position

Table 6 Ai-WB3-12F-Kit indicator light and key position

①	RGB light (red light connected to IOA7, green light connected to IOA10, blue light connected to IOA11, active high level)
②	Reset button
③	Burning key, burning firmware is the need to press the burning key and then short press the reset button
④	Cold lamp (connected to IOB3, active at high level)
⑤	Warm lamp (connected to IOA12, active at high level)

5. Pin definition

Ai-WB3-12F-Kit to a total of 30 interfaces. For example, the pin diagram, the pin function definition table is the interface definition.



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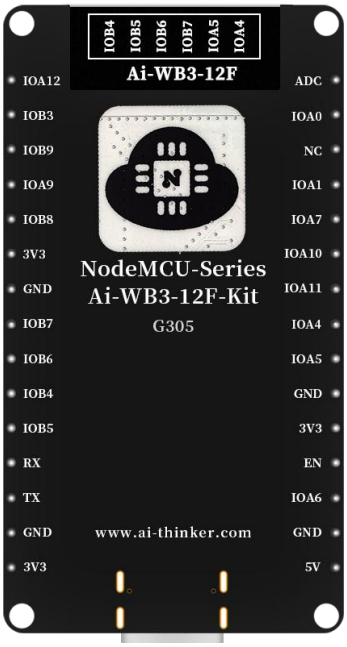

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Figure 6 pin diagram

Table 7 Definition table of pin functions

No.	Name	Function

1	ADC	ADC pin, and IOA0 pin partial pressure
2	IOA0	GPIOA0/ADC/EXT_INT/FULLMUX
3	NC	Empty feet
4	IOA1	GPIOA1/ADC/SWD/EXT_INT/FULLMUX
5	IOA7	GPIOA7/SDIO_IO3/EXT_INT/FULLMUX
6	IOA10	GPIOA10/SDIO_IO0/I2S_SDO/FULLMUX
7	IOA11	GPIOA11/SDIO_IO1/FULLMUX
8	IOA4	GPIOA4/ADC/SWCK/FULLMUX
9	IOA5	GPIOA5/EXT_INT/FULLMUX
10	GND	Ground
11	3V3	3.3V power supply
12	EN	By default, it is enabled on the chip. The high level is valid
13	IOA6	GPIOA6/SDIO_IO2/I2S_SDI/EXT_INT/FULLMUX
14	GND	Ground
15	5V	5V power supply
16	3V3	3.3V power supply
17	GND	Ground
18	TX	TXD/GPIOA2/EXT_INT/FULLMUX
19	RX	RXD/GPIOA3/EXT_INT/FULLMUX
20	IOB5	GPIOB5/ADC/FULLMUX
21	IOB4	GPIOB4/ADC/FULLMUX
22	IOB6	GPIOB6/FULLMUX
23	IOB7	GPIOB7/FULLMUX
24	GND	Ground
25	3V3	3.3V power supply
26	IOB8	GPIOB8/FULLMUX
27	IOA9	GPIOA9/SDIO_CLK/I2S_SCLK/FLLMUX/BOOT_MODE
28	IOB9	GPIOB9/FULLMUX/EXT_INT
29	IOB3	GPIOB3/ADC/FULLMUX
30	IOA12	GPIOA12/FULLMUX
Note: 1. IOA9, as Bootstrap, was powered on at low power level, and the development board entered the burning mode; The power-on moment is in normal hours, and the development board starts normally. The development board supports one master/slave I2C interface and two SPI interfaces, and any two pins with FULLMUX feature can be configured for I2C and SPI.		

6. Schematic diagram

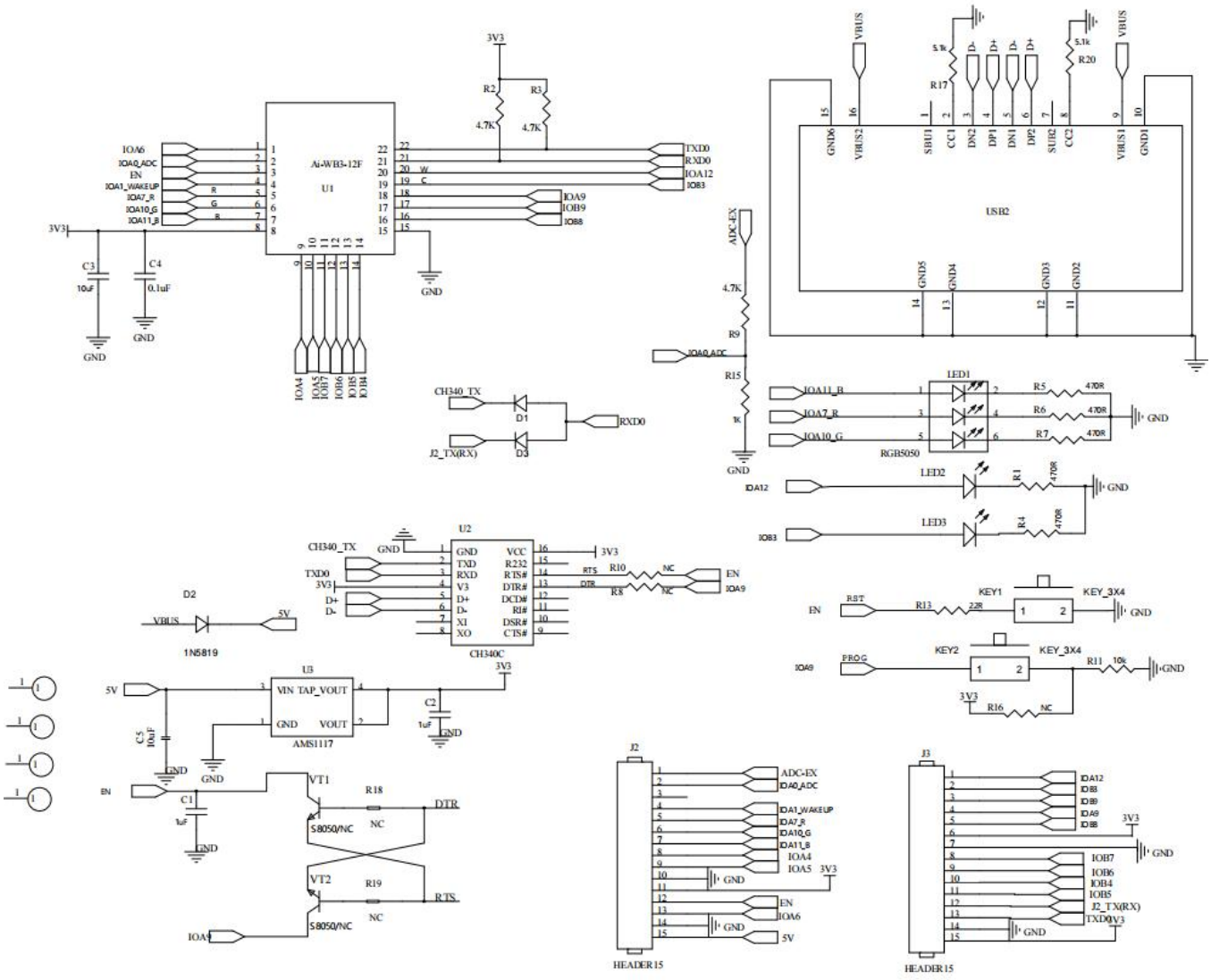

Figure 7 schematic diagram

7. Product package information

Table 8 packing information table

Packing List	Packaging method	Per package (Electrostatic)	Per package (Sealed bag)
Ai-WB3-12F-Kit	Foam+ Electrostatic bag	1pcs	20pcs

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