

802.11 b/g/n Wi-Fi + BLE 4.2 Kit

Version: V1.0

The BW15-Kit development board is a core development board designed by Essence for the BW15 module. The development board continues the classic design of the NodeMCU development board. Need to connect peripherals. When using the breadboard for development and debugging, the standard headers on both sides can make the operation easier and more convenient.

The BW15 module is developed by Boantong. BW15 is a highly integrated Wi-Fi and Bluetooth SOC module. The main chip RTL8720CF is a 2.4GHz wireless LAN (WLAN) and Bluetooth low energy (v4.2) Highly integrated low-power chip; It combines Real-M300 MCU, WLAN MAC, WLAN baseband with 1T1R function in a single chip. It also provides configurable GPIOs, which are configured as digital peripherals for different applications and control purposes.

BW15 also integrates internal memory, which can achieve complete WIFI and BLE4.2 protocol functions. Embedded memory configuration also supports simple application development.

Characteristic:

- Support 802.11 b/g/n 1x1, 2.4GHz
- Support MCS7 up to 20MHz / 40MHz
- Low power architecture
- Support low-power transmission/reception, suitable for short-distance applications
- Low-power beacon monitoring mode, low-power receiving mode, low-power suspend mode
- Built-in AES/SHA hardware engine
- Built-in 2MB Flash
- Support BLE4.2 BQB
- Support central and peripheral modes
- The internal coexistence mechanism between WIFI and BT shares the same antenna
- Support STA/AP/STA+AP working mode
- Support Smart Config (APP)/AirKiss (WeChat) for Android and IOS One-click network configuration
- Support serial port local upgrade and remote firmware upgrade (OTA)
- General AT commands can be used quickly

Module model	BW15
Encapsulation	SMD-16
size	24*16*3(±0.2)MM
Antenna form	Onboard PCB antenna/IPEX antenna
Spectrum range	2400 ~ 2483.5MHz
Bluetooth	Bluetooth4.2 BLE
Bluetooth frequency	2.402GHz ~ 2.480GHz
Operating temperature	-40 °C ~ 85 °C
Storage environment	-40 °C ~ 125 °C, <90%RH

Power supply range	Supply voltage 3.0V ~ 3.6V, supply current >500mA
Support interface	UART/GPIO/ADC/PWM/IIC/SPI

Note: BW15 series modules are electrostatic sensitive devices, and special precautions need to be taken when handling



Absolute maximum rating

Anything exceeding the following absolute maximum ratings may cause damage to the chip

Name	Minimum value	Typical value	Maximum value	Unit
Micro USB power supply voltage	4.75	5	5.25	V
Supply voltage	2.6	3.3	3.6	V
Operating temperature	-40	-	85	°C
Storage temperature	-40	-	125	°C

WIFI RF performance

Describe	Typical value	Unit
Working frequency	2400 ~ 2483.5	MHz
Output Power		
In 11n mode, the PA output power is	15±2	dBm
In 11g mode, the PA output power is	16±2	dBm
In 11b mode, PA output power	18±2	dBm

Receiving sensitivity		
CCK , 1 Mbps	≤-98	dBm
CCK , 11 Mbps	≤-90	dBm
6 Mbps (1/2 BPSK)	≤-94	dBm
54 Mbps (3/4 64-QAM)	≤-77	dBm
HT20 (MCS7)	≤-74	dBm

Bluetooth RF performance

Describe	Typical value	Unit
working frequency	2400 ~ 2483.5	MHz
Output Power		
PA output power is	7±2	dBm
Receiving sensitivity		
Receiving sensitivity	≤-92	dBm

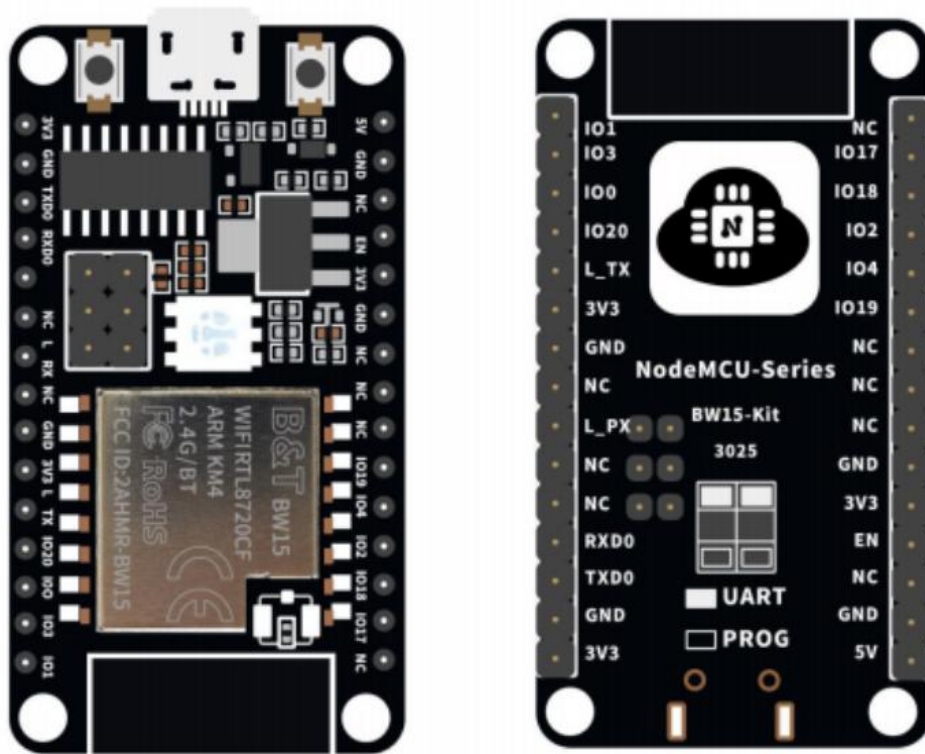
Power consumption

The following power consumption data is based on a 3.3V power supply, an ambient temperature of 25° C, and measured using an internal voltage regulator.

All measurements are done at the antenna interface without SAW filter.

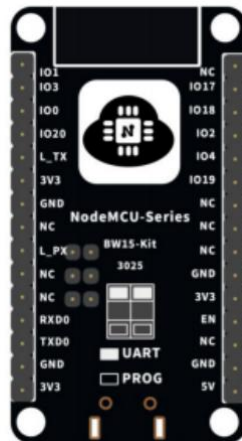
All emission data is based on 90% duty cycle, measured in continuous emission mode.

Name	Minimum value	Typical value	Maximum value	Unit
Transmit 802 11b, CCK 11Mbps, POUT=+17dBm		250		mA
Transmission 802 11g, OFDM 54Mbps, POUT = +15dBm		210		mA
Transmit 802 11n, MCS7, POUT = +13dBm		195		mA
Receive 802 11b, packet length 1024 bytes, -80dBm		50		mA
Receive 802 11g, packet length 1024 bytes, -70dBm		56		mA
Receive 802 11n, packet length 1024 bytes, -65dBm		56		mA
Modem-Sleep①		20		mA
Light-Sleep②		2		mA
Deep-Sleep③		28		uA
Power Off		0 . 5		uA



Pin definition

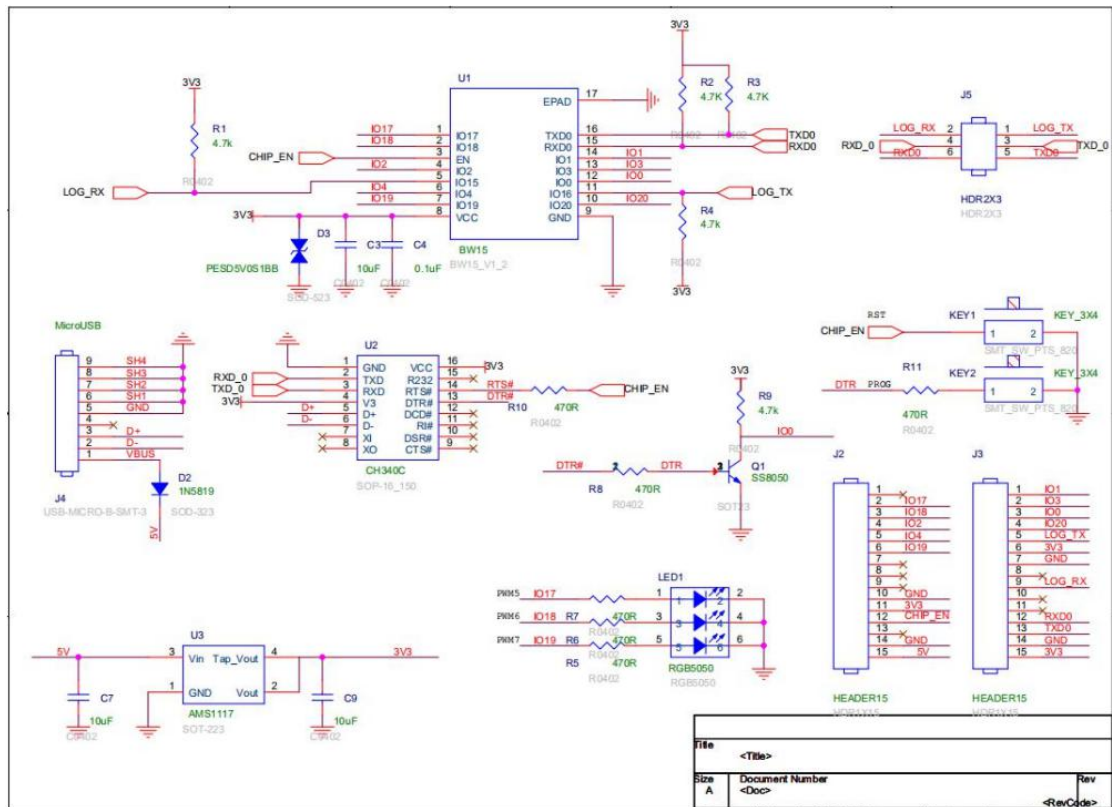
The BW15-Kit development board module has a total of 30 interfaces. As shown in the pin diagram, the pin function definition table is the interface definition.



PINS	NAME	Function Description
1	IO1	GPIOA_ 1/UART1_OUT/PWM1
2	IO3	GPIOA_ 3/UART1_OUT/SPI_SCL/I2C_SDA/PWM3
3	IO0	GPIOA_ 0/UART1_ IN/EXT_ 32K/PWM0
4	IO20	GPIOA_ 20/SD_D1/SPI_M_D1/UART2_RTS/SPI_MISO/I2C_SDA/ PWM0

5	L TX	GPIOA_16/SD_D3/SPI_M_CLK/UART2_OUT/SPI_SCL/I2C_SDA/ PWM4
6	3V3	3 3V power supply (VDD); maximum 500mA
7	GND	Grounded
8	NC	null
9	L RX	GPIOA_15/SD_D2/SPI_M_CS/UART2_IN/SPI_CS/I2C_SCL/ PWM 3
10	NC	null
11	NC	null
12	RXD0	AT UART RX
13	TXD0	AT UART TX
14	GND	Grounded
15	3V3	3 3V power supply (VDD); maximum 500mA
16	NC	null
17	I017	GPIOA_17/SD_CMD/SPI_M_D2/PWM5
18	I018	GPIOA_18/SD_CLK/SPI_M_D3/PWM6
19	I02	GPIOA_2/UART1_IN/SPI_CS/I2C_SCL/PWM2
20	I04	GPIOA_4/UART1_CTS/SPI_MOSI/PWM4
21	I019	GPIOA_19/SD_D0/SPI_M_D0/UART2_CTS/SPI_MOSI/I2C_SCL/ PWM7
22	NC	null
23	NC	null
24	NC	null
25	GND	Grounded
26	3V3	3 3V power supply (VDD); maximum 500mA
27	EN	Chip enable terminal
28	NC	null
29	GND	Grounded
30	5V	5V power supply

Schematic diagram



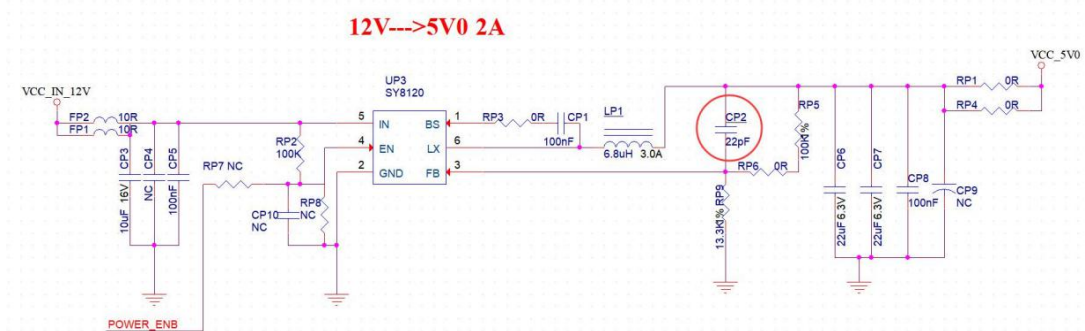
1. Power supply

(1) Recommended 3.3V voltage, peak current above 500mA

(2) It is recommended to use LDO for power supply; if using DC-DC, it is recommended that the ripple be controlled within 30mV.

(3) It is recommended to reserve the position of the dynamic response capacitor for the DC-DC power supply circuit, so that the output ripple can be optimized when the load changes greatly.
Wave.

(4) It is recommended to add ESD devices to the 5V power interface.



2. Antenna layout requirements

It is forbidden to place metal parts around the module antenna, away from high-frequency components.

