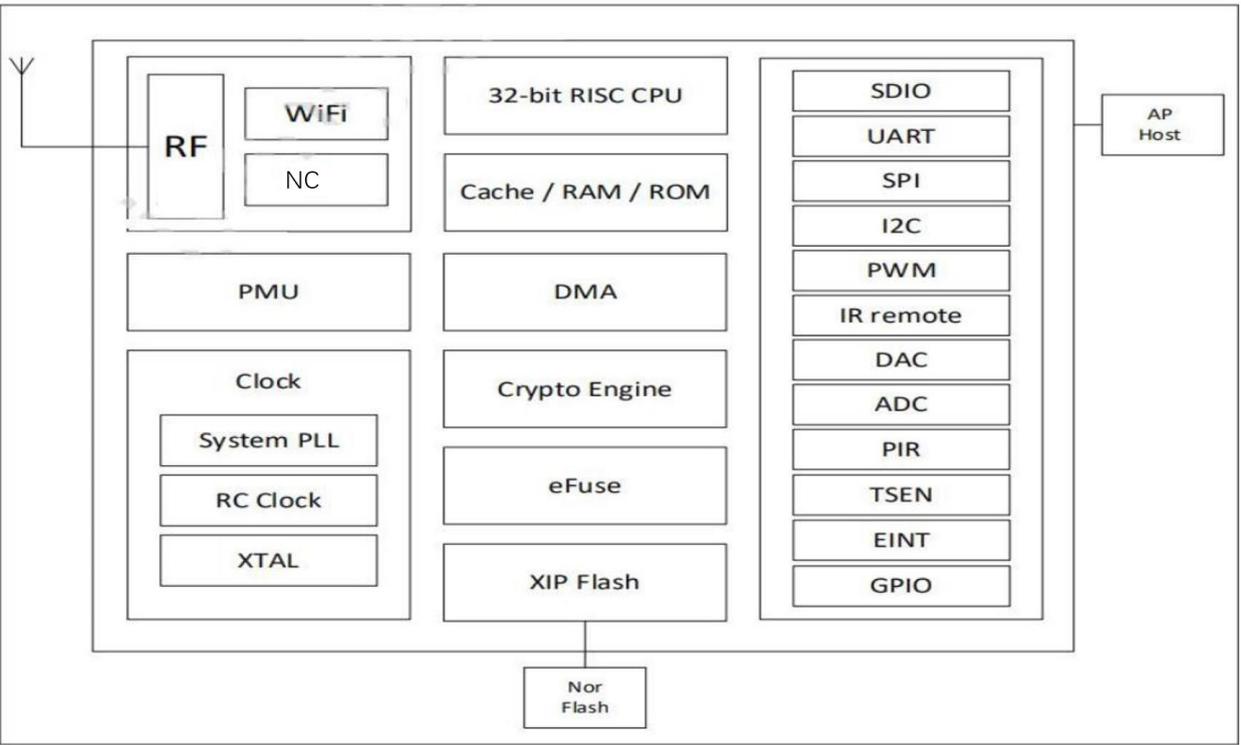# CPEWIFI02

Specification

Version V1.1.2

1. Product Overview

CPEWIFI02 is a Wi Fi module that is equipped with the BL602 chip as the core processor and supports the Wi Fi 802.11b/g/n protocol. The BL602 chip is equipped with a low-power 32-bit RISC CPU, 276KB of RAM, and rich peripheral interfaces, including SDIO, SPI, UART, I2C, IR remote, PWM, ADC, DAC, PIR, and GPIO. It can be widely used in fields such as the Internet of Things (IoT), mobile devices, wearable electronic devices, and smart homes.

FCC ID: YA3-CPEWIFI02
IC:10186A-CPEWIFI02

Figure 1 Main
chip
architecture
diagram

1.1. Characteristics

- Wi Fi security support for WPS/WEP/WPA/WPA2 Personal/WPA2 Enterprise/WPA3 20MHz bandwidth with a maximum rate of 72.2 Mbps

- Support Station mode, Station+SoftAP mode

- Supports 32 bit RISC CPU, 276KB RAM images signed with ECC-256

- Supports QSPI/SPI Flash Instant AES Decryption （OTFAD）and AES 128 CTR mode

providing application program interfaces such as signature and verification

- Supports SDIO, SPI, UART, I2C, IR remote, PWM, ADC, DAC, PIR, GPIO, etc

2. Main parameters

Table **1** Main
Parameter
Description

model	CPEWIFI02
encapsulation	SMD-16
size	17.0 * 16.0 * 3.1 (± 0.2) mm
Antenna	IPEX seat
Spectrum	2400~2483.5MHz
working	-40 ℃~85 ℃
Storage	-40 ℃~125 ℃,<90% RH
Power	Power supply voltage 2.7V~3.6V, power supply current ≥ 500mA
Supporting	UART/GPIO/ADC/PWM/I2C/SPI
Available **IO**	11
Series Rate	Default 115200 bps
Security	WPS/WEP/WPA/WPA2 Personal/WPA2 Enterprise/WPA3
Flash	Default 4MByte, supports extension

2.1. Static electricity requirements

CPEWIFI02 is an electrostatic sensitive device that requires special precautions during handling.

Figure 2 ESD
Anti Static
Diagram

2.2. Electrical characteristics

Table **2** Electrical
Characteristics
Table

parameter		condit	minimum	Typical	Maximum	unit
Supply		VDD	two point seven	three point three	three point six	V
I/O	VIL	-	-	-	0.3 * VDDIO	V
	VIH	-	0.7 * VDDIO	-	-	V
	VOL	-	-	0.1 * VDDIO	-	V
	VOH	-	-	0.9 * VDDIO	-	V
	IMAX	-	-	-	fifteen	MA

2.3. **Wi Fi** RF Performance

Table **3 Wi Fi** RF
Performance Table

describe	Typical value			unit
Spectrum range	2400~2483.5MHz			MHz
output power				
mode	minimum	Typical	Maximum	unit
11n mode HT20, PA output	-	sixteen	-	DBm
11g mode, PA output power	-	seventeen	-	DBm
11b mode, PA output power	-	nineteen	-	DBm
Receiving sensitivity				
mode	minimum	Typical	Maximum	unit
11b, 1 Mbps	-	-98	-	DBm
11b, 11 Mbps	-	-90	-	DBm
11g, 6 Mbps	-	-93	-	DBm
11g, 54 Mbps	-	-76	-	DBm
11n, HT20 (MCS7)	-	-73	-	DBm

2.5. Power consumption

The following power consumption data is based on a3.3V power supply, an ambient temperature of 25 ° C, and measured using an internal voltage regulator.

Table 5 Power
Consumption Table

mode	minimum	average	Maximum	unit
Transmit 802.11b, 11Mbps,	-	two	-	MA
Transmit 802.11g, 54Mbps, POUT=+18dBm	-	two	-	MA
Transmit 802.11n, MCS7, POUT=+17dBm	-	two	-	MA
Receive 802.11b with a packet length	-	sixty-five	-	MA
Receive 802.11g with a packet length	-	sixty-five	-	MA
Receive 802.11n with a packet length	-	sixty-five	-	MA
Deep Sleep	-	twelve	-	μA

3. Appearance dimensions

Front and back
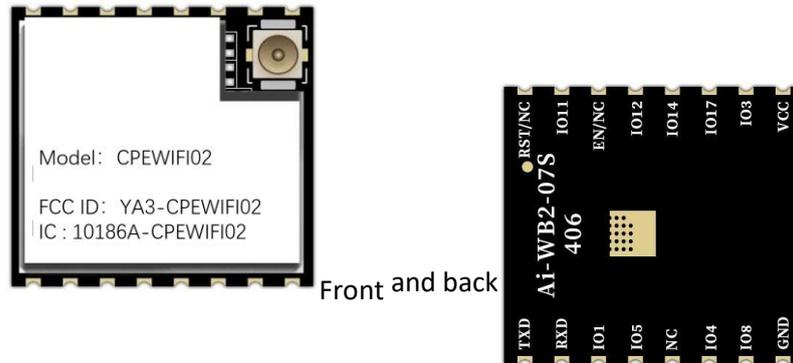
Figure 3 Appearance (Rendered image for reference only, subject to actual object)

FLASH size（MB）

Module temperature version

H: High

tempera

ture N:

Normal

tempera

ture

FLASH

FLASH type

O: Chip external flash I:
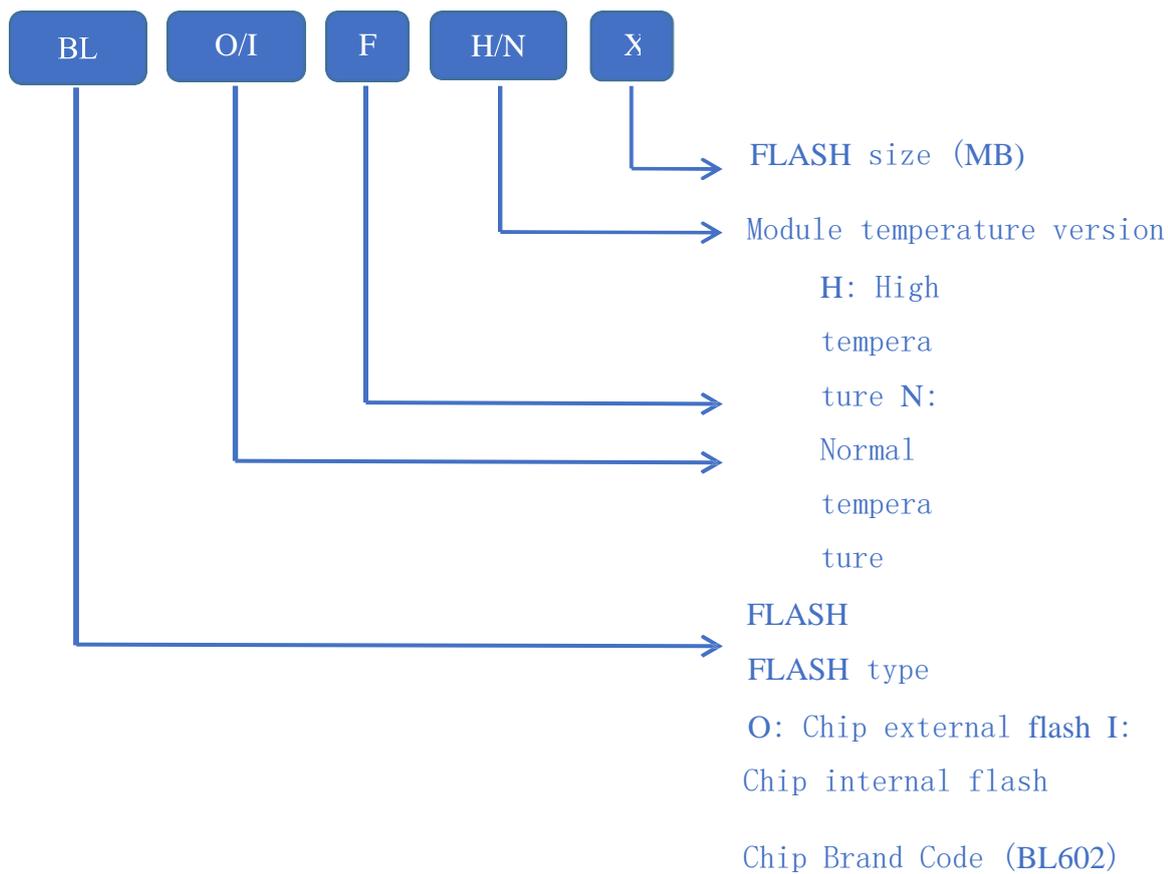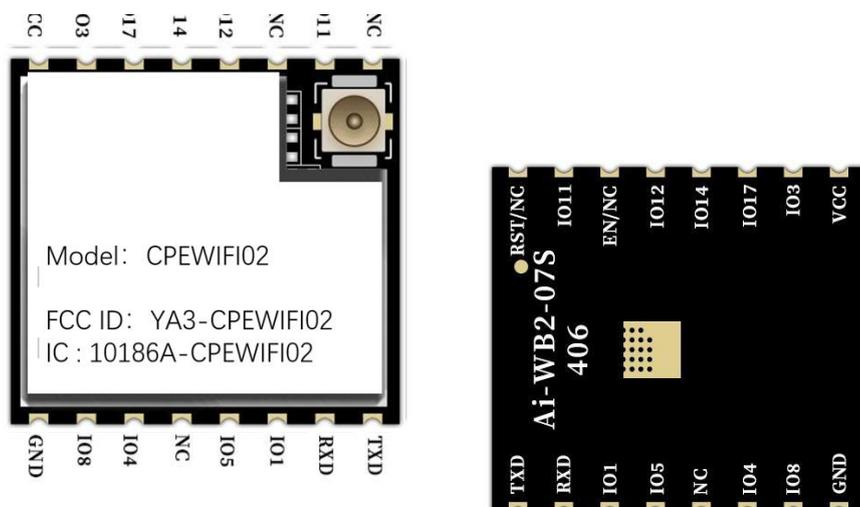
Chip internal flash

Chip Brand Code（BL602）

Figure 5 Screen printing representative information of the shielding cover

4. Pin Definition

The CPEWIFI02 module has a total of 16 pins connected, as shown in the pin diagram. The pin function definition table is the interface definition.

Front   and back

Figure 6 Schematic diagram of pins

<div align="center">Table **6** Pin
Function Definition
Table</div>

Foot order	name	Function Description
one	RST/NC	Default suspended, customizable as reset pin, effective at low level. If you need to use it, please contact Anxin
two	IO11	GPIO11/SPI_ SCLK/IIC_ SDA/ADC_ CH10
three	EN/NC	By default, it is enabled as a chip, effective at high levels, and cannot be used simultaneously with RST
four	IO12	GPIO12/SPI_ MOSI/MISO/IIC_ SCL/PWM_ CH2/ADC_ CH0
five	IO14	GPIO14/SPI_ SS/IIC_ SCL/PWM_ CH4/ADC_ CH2
six	IO17	GPIO17/SPI_ MOSI/MISO/IIC_ SDA/PWM_ CH2
seven	IO3	GPIO3/SPI_ SCLK/IIC_ SDA/PWM_ CH3
eight	VCC	3.3V power supply; The recommended output current of the external power supply is above 500mA
nine	GND	Grounding
ten	IO8	GPIO4/SPI_ MOSI/MISO/IIC_ SCL/PWM_ CH4/ADC_ CH4
eleven	IO4	Not recommended for use, shared with internal Flash of the module. If you need to use it, please contact Anxinke GPIO2/SPI_ SS/IIC_ SCL/PWM_ CH2
twelve	NC	Default NC, cannot be used. If you need to use it, please contact Anxinke. If exported, the function supports Bootstrap/GPIO8/SPI_ MOSI/MISO/IIC_ SCL/PWM_ CH3
thirteen	IO5	GPIO5/SPI_ MOSI/MISO/IIC_ SDA/PWM_ CH0/ADC_ CH4
fourteen	IO1	Not recommended for use, shared with internal Flash of the module. If you need to use it, please contact Anxinke GPIO1/SPI_ MOSI/MISO/IIC_ SDA/PWM_ CH1
fifteen	RXD	RXD/GPIO7/SPI_ SCLK/IIC_ SDA/PWM_ CH2
sixteen	TXD	TXD/GPIO16/SPI_ MOSI/MISO/IIC_ SCL/PWM_ CH1

Note: 1. As a **Bootstrap**, **GPIO8** is at high power level upon powering on, and the module enters burn mode; At the moment of power on, it is at a low level, and the module starts normally.
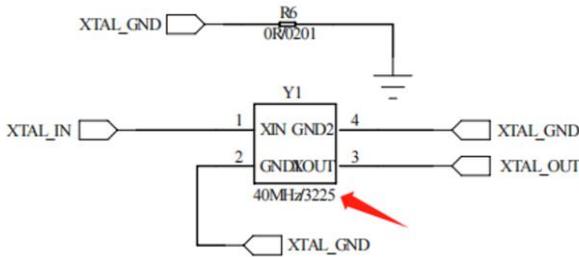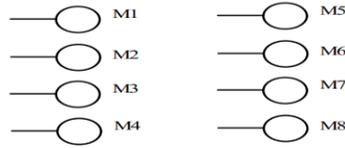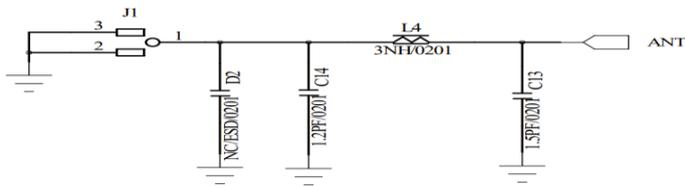
5、Schematic diagram
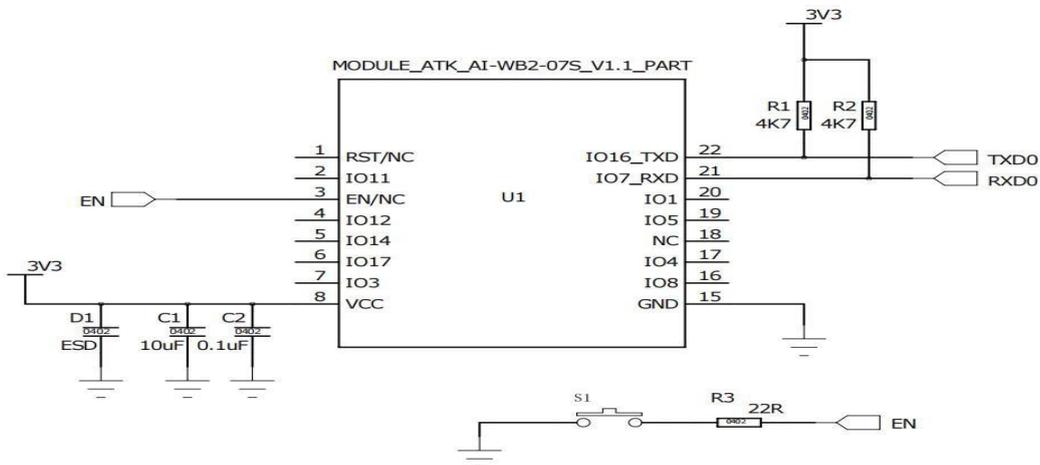
Figure **7** Schematic diagram

Figure **8** Application Guidance Circuit

port is used as PWM, it is recommended to reserve a 4.7K pull-down resistor on the periphery of the module. Especially in the application of light control, to prevent flashing lights during power on startup. If you need to use it, please contact Anxinke.
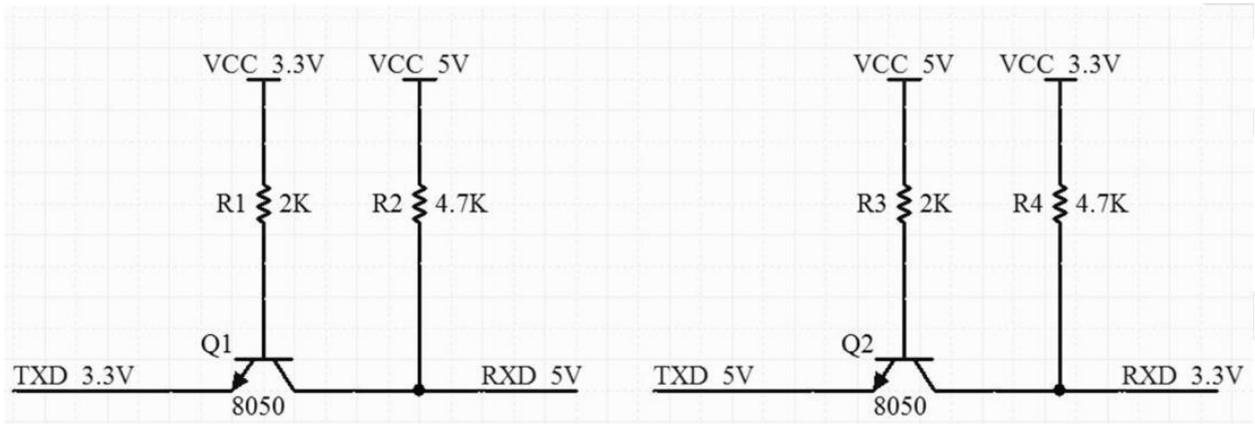
6. Recommended **PCB** packaging size

Figure **9** Recommended
PCB Packaging
Dimensions

7. Power supply

It is recommended to add ESD devices for the ▤🔌▤✝ power interface.

Figure **10 DC-DC** buck circuit diagram

Figure 11 Level Conversion Circuit

7. Storage conditions

Products sealed in moisture-proof bags should be stored in a non condensing atmospheric environment of<40 ℃/90% **RH**. The humidity sensitivity level **MSL** of the module is level **3**.

After the vacuum bag is unsealed, it must be used within 168 hours at 25 ± 5 ℃/60% **RH**, otherwise it needs to be baked before being put back on line again.

8. For Both FCC & IC application

This device complies with Part 15 of the FCC Rules / Industry Canada licence-exempt RSS standard(s). 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.

 Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the

instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: —Reorient or relocate the receiving antenna. —Increase the separation between the equipment and receiver. —Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. —Consult the dealer or an experienced radio/TV technician for help. 16 MPE Requirements To satisfy FCC / IC RF exposure requirements, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during device operation. To ensure compliance, operations at closer than this distance is not recommended.

Les antennes installées doivent être situées de facon à ce que la population ne puisse y être exposée à une distance de moin de 20 cm. Installer les antennes de facon à ce que le personnel ne puisse approcher à 20 cm ou moins de la position centrale de l' antenne. La FCC des éltats-unis stipule que cet appareil doit être en tout temps éloigné d' au moins 20 cm des personnes pendant son functionnement.

The requirement for KDB 996369 D03:

1.1 List of applicable FCC rules
FCC Part 15.247

1.2 Summarize the specific operational use conditions
EUT use external antenna and RP-SMA to IPEX cable here

1.3 Limited module procedures
The module is a single module, so this requirement is not applicable to the product

1.4. Trace antenna designs
Not appliance

1.5 RF exposure considerations
The host device can be used as mobile device.

1.6 Antennas
2.4G
Gain: 5.57dBi max
Antenna type: omni antenna

1.7 Label and compliance information
If this certified module is installed inside the host device, then the outside of the host must be labeled
with "Contains FCC ID: YA3-CPEWIFI02 and IC: 10186A-CPEWIFI02

1.8 Information on test modes and additional testing requirements
The host manufacturer can use the software of BLDevCube.exe to make the WIFl transmit Continuously.

1.9. Additional testing, Part 15 Subpart B disclaimer
The module only complies with the FCC Part 15.247. If the module is installed in the host device, the host
manufacturer is responsible for the compliance to any other FCC rules that apply to the host not covered
by the modular transmitter grant of certification. For example, if the host manufacturer markets their
product as being Part 15 Subpart B compliant (when it also contains unintentional-radiator digital
circuity), then the host manufacturer shall provide a notice stating that the final host product still
requires Part 15 Subpart B compliance testing with the modular transmitter installed.