



WiFi Module

BC30 Hardware Manual



3. Pin Definition

3.1 Pin Layout

1	RST	TXD	22
2	ADC	RXD	21
3	GPIO12	GPIO1	20
4	GPIO0	GPIO4	19
5	GPIO2	GPIO8	18
6	GPIO3	GPIO7	17
7	GPIO13	GPIO9	16
8	VBAT	GND	15
	GPIO5		
	GPIO25		
	GPIO21		
	GPIO23		
	GPIO24		
	GPIO22		
9			
10			
11			
12			
13			
14			

3.2 Pin Definition

Pin	Name Of Pin	Type	Description
1	RST	I	Power Down signal of the chip

2	GPADC0	I/O	General purpose ADC
3	GPIO12	I/O	General purpose input/output
4	GPIO0	I/O	General purpose input/output
5	GPIO2	I/O	General purpose input/output
6	GPIO3	I/O	General purpose input/output
7	GPIO13	I/O	General purpose input/output
8	VBAT	PWR	Power supply
9	GPIO5	I/O	General purpose input/output
10	GPIO25	I/O	General purpose input/output
11	GPIO21	I/O	General purpose input/output
12	GPIO23	I/O	General purpose input/output
13	GPIO24	I/O	General purpose input/output
14	GPIO22	I/O	General purpose input/output
15	GND	GND	Buck ground
16	GPIO9	I/O	General purpose input/output
17	GPIO7	I/O	General purpose input/output
18	GPIO8	I/O	General purpose input/output
19	GPIO4	I/O	General purpose input/output
20	GPIO1	I/O	General purpose input/output
21	RXD	I	UART_RX
22	TXD	O	UART_TX

4. Features

4.1 Product Features

- ◆Smallest 802.11b/g/n Wi-Fi SoC module
- ◆Adopt Low power 32-bit CPU, double as an application processor

- ◆Main frequency up to 160MHz
- ◆Built-in 10bit high precision ADC
- ◆Supports interfaces such as UART/GPIO/IIC/PWM/ADC
- ◆SMD-22 package for easy soldering and testing
- ◆Integrated Wi-Fi MAC/BB/RF/PA/LNA
- ◆Support multiple sleep modes, standby power consumption as low as 1.0mA
- ◆Embedded Lwip protocol stack
- ◆Support STA/AP/STA+AP working mode
- ◆support Smart Config to configure the network
- ◆Serial port speed up to 4Mbps
- ◆Universal AT commands for quick start
- ◆Support for serial local upgrade and remote firmware upgrade (OTA)

4.2 Product specifications

Model Number	BC30
Package	SMD-22
Size	24*16*3 (±0.2) mm
SPI Flash	Default 32Mbit
Support interface	UART/GPIO/ADC/PWM
Number of IO Port	16
Serial port speed rate	Support 9600-4608000bps, default 115200bps
Spectrum range	2412-2462MHz
Antenna form	Onboard PCB antenna, gain 2.5dBi
Transmit power	802.11b:17+1 dBm (@11Mbps) 802.11g:17+1 dBm (@54Mbps) 802.11n:14+1 dBm (@HT20, MCS7)
Receiver sensitivity	CCK, 1Mbps: -90dBm CCK, 11Mbps: -85dBm 6Mbps (1/2 BPSK) : -88dBm 54Mbps (3/4 64-QAM) : -70dBm HT20, MCS7 (65Mbps, 72.2Mbps) : -67dBm
Power consumption	Continuous transmission => average: ~70mA, peak: 250mA Sleep: ~20mA User Sleep: ~1mA

safety	WEP/WPA-PSK/WPA2-PSK
Power supply range	Supply voltage 3.0V~3.6V, supply current >300mA
Operating temperature	-20°C~85°C
Storage environment	-40°C~85°C, <90%RH
weight	1.4g
Certification	FCC、CE

4.3 Technical Parameters

Classification	Project	Parameters
Wifi	Wireless standard	802.11 b/g/n
	Frequency Range	2412M ~ 2462MHz
	Receiving sensitivity	802.11 b: -91 dBm (11 Mbps)
		802.11 g: -75 dBm (54 Mbps)
		802.11 n: -72 dBm (MCS7)
	Antenna option	PCB onboard antenna
Hardware	CPU	ARM Cortex M4 32 bit microcontroller
	Peripheral bus	UART/SDMC/SPI/I2C/I2S/
		GPIO/ADC/PWM/LED Light & Button
	Operating Voltage	3.0V ~ 3.6V
	Working current	Average current: 70 mA
	Operating temperature	-20°C ~ 85°C
	Ambient temperature	-40°C ~ 85°C
	Package size	24mm*16mm*3.0mm
Software	External interface	N/A
	Wifi mode	Station/SoftAP+Station
	Security Mechanism	WPA/WPA2
	Encryption type	WEP/TKIP/AES
	Upgrade firmware	UART Download/OTA (via network)
	Software development	Support Cloud Server Development/Firmware and SDK for fastSpeed programming
	Network protocol	IPv4、TCP/UDP/HTTP/FTP/MQTT
	User configuration	AT+ command set, cloud server, Android/iOS APP

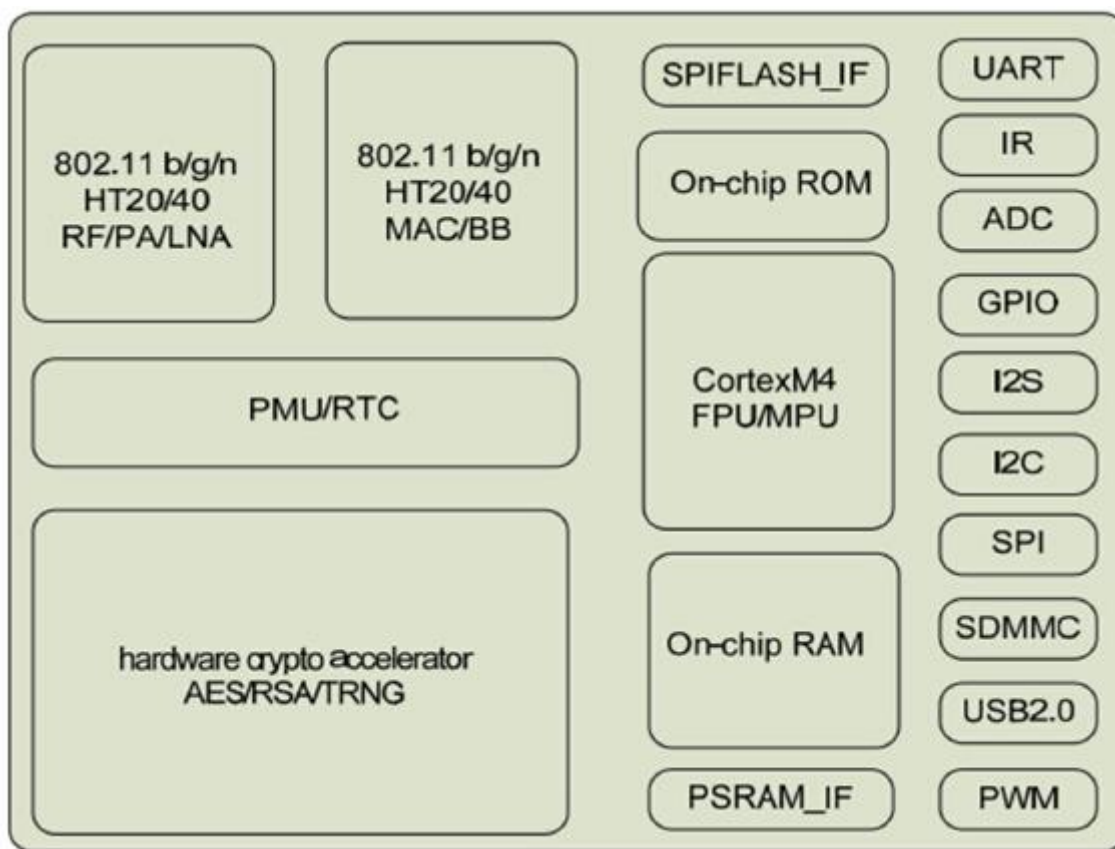
5. Power consumption

Parameter	Minimum	Typical	Maximum	Unit
Tx802.11b, CCK 11Mbps, P OUT=+17 dBm		170		mA
Tx 802.11g, OFDM 54 Mbps, P OUT =+15 dBm		140		mA
Tx 802.11n, MCS7, P OUT =+13 dBm		120		mA
Rx 802.11b, 1024 Bytes, -80 dBm		50		mA
Rx 802.11g, 1024 Bytes, -70 dBm		56		mA
Rx 802.11n, 1024 Bytes, -65 dBm		56		mA
Sleep		20		mA
User Sleep		5		mA
Close		0.5		mA

6. Electrical characteristics

Parameter	Condition	Minimum	Typical	Maximum	Unit
Storage temperature	-	-40	Normal temperature	85	°C
Maximum soldering temperature	IPC/JEDEC JSTD-020	-	-	210	°C
Operating Voltage	-	3.0	3.3	3.6	V
VIL/VIH I/OVOL/VOH IMAX	-	-0.3/0.75VIO	-	0.25VIO/3.6	V
	-	N/0.8VIO	-	0.1VIO/N	V
	-	-	-	12	mA

7. Functional schematic



7.1 CPU

BC30 built-in ARM Cortex M4 32-bit microprocessor (MCU) with ultra low 16-bit RSIC for power consumption. The CPU clock speed is 80 MHz and can be up to 160 MHz. Support for real-time operating system (RTOS). Currently, the Wi-Fi protocol stack uses only 20% of MIPS, and others can be used for application programming and development. The CPU includes the following interfaces:

- ◆ Configurable RAM/ROM (iBus) with on-chip memory controller and external Flash
- ◆ Data RAM interface (dBus) connected to the storage controller
- ◆ Access register AHB interface

7.2 Built-in storage

The BC30 chip has a built-in memory controller that includes ROM and SRAM. The MCU can access the memory controller through the iBus, dBus, and AHB interfaces. All storage units can be accessed after the request is initiated. The storage arbiter determines the order of access

based on when the processor accepts these requests. According to the SDK provided by our company, when the BC30 is running in the Station mode and connected to the route, the available SRAM space in the Heap+ Data area is 96kB. Embedded 8Mbit Flash storage.

7.3 External Flash

The BC30 uses an external SPI Flash to store the user program. In theory, it can support up to 16MB of storage.

8. Applications

- ◆ Household appliances
- ◆ Home automation
- ◆ Smart socket, smart light
- ◆ Mesh network
- ◆ Industrial wireless control
- ◆ Baby monitor
- ◆ IP camera
- ◆ Sensor Networks
- ◆ Wearable electronics
- ◆ Wireless location aware device
- ◆ Security ID tag
- ◆ Wireless positioning system beacon

9. FCC Statement

This device complies with Part 15 of the FCC rules. 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.

Note: 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 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.

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

FCC Radiation Exposure Statement

This device complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This device must operate with a minimum distance of 20 cm between the radiator and user body.

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: 2AQSK-BC30"

When the module is installed inside another device, the user manual of this device must contain below warning statements; 1. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference. (2) This device must accept any interference received, including interference that may cause undesired operation. 2. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.