Specifications

BW14 802.11 b/g/n Wi-Fi Module

BW14

Version：V 1.0

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Document development / revision / revocation resume

Version	Date	Development/revision	Development	Approval
V1.0	2019.05.10	First edition	Yiji Xie	

1.Product Overview

BW14 is a highly integrated Wi-Fi SOC module, the main chip is RTL8710BX a height set single chip low power 802.11 n wireless local area network (WLAN) network controller. And it will ARM-CM4F MCU、WLAN MAC、1T1R supported WLAN baseband and RF integrated in one chip.BW14 integrated internal memory to achieve a complete WIFI protocol function. Embedded Memory Configuration. For simple application development.

The BW14 module adopts the WiFi chip design module of Realtek RTL8710 series, which is suitable for small home appliance applications. This module does no need to board design ,4 PIN wiring to achieve MCU end through WIFI penetration data interaction to the cloud. This relatively independent module does not affect the design of the main board circuit, only require to lead out the serial line, for the space structure of the designer is very practical. It just needs wiring, provides a lot of convenience for production installation or troubleshooting.

BW14 support 5 V of power supply, designers do not have to consider whether the level of the 5 V MCU and whether compatible.

BW14 support on-board antenna and IPEX external antenna in complex application network scenarios

Switching is very flexible, customers can choose a more suitable antenna scheme according to actual requirements

2.Characteristics

Wireless parts

Items	Description
WIFI	● 802.11b/g/n W i-Fi SoC module ● Support UART interface ● DSSS with DBPSK and DQPSK, CCK Modulation and long or short sequence to support multiple sleep modes ● Embedded Lwip and FreeRTOS ● Support STA/AP/STA+AP operating mode ● Support Smart Config/ wechat AirKiss One-click distribution ● Generic AT instructions can be used quickly ● Support for local serial port upgrades and remote firmware upgrades（FOTA） ● Support MQTT/TCP protocol to use cloud（second develop）

Security parts

| Items	Description
CPU	RTL8710BX
External interface	UART
Security mechanisms	WPA/WPA2
Upgrade firmware	UART Download/OTA(Network connection)
Software development	SDK
Internet protocol	IPv4、TCP/UDP/HTTP/MQTT
User configuration	AT+command set, cloud server

3.Applications

- Home appliances
- home automation, intelligent socket, intelligent lamp
- Industry line control

4. Main parameters

Hardware Features	
Model	BW14
Antenna Type	PCB Antenna/IPEX座子
Major Chipset	RTL8710BX
Power Supply	供电电压5V ~ 12V
Dimension	50.5*29.2*3.3（±0.2）mm
WIFI Wireless Features	
Wireless Standards	IEEE 802.11 b/g/n
Frequency Range	2400 ~ 2483.5MHz
Work Mode	AP, Station, AP/Client
Others	
Environment（环境）	Operating Temperature:　-20℃~70℃
	Storage Temperature:　-40℃~125℃
	Operating Humidity:　　10%~90% (non-condensing)
	Storage Humidity:　　5%~90%　(non-condensing)

5. Block Diagram
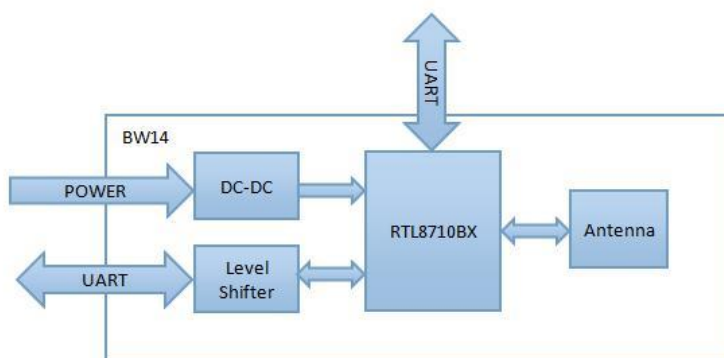
6.Electrical parameters

1) DC Characteristics

Power consumption (typical value)	Power supply 12 V , 10 mA, Peak :50 mA	
ESD Protection	2000	V

BW14 series modules are Electrostatic Sensitive Devices and require special precautions while handling.

ESD precautions:

The BW14 module are electrostatic sensitive devices (ESD) and require special ESD precautions applied to ESD sensitive components. Proper ESD handling and packaging procedures must be applied throughout   the processing, handling, transportation and operation of any application that incorporates the BW14 module. Don't touch the module by hand or solder with non-anti-static soldering iron to avoid damage to the module.

2）RF parameters（IEEE802.11b）

Items	Contents			
Specification	IEEE802.11b			
Mode	CCK 11 Mbps			
Channel frequency	2400 ~ 2483.5MHz			
Freq.Error(±15ppm)	±10 ppm			
RX (PER≤-76dBm@8%)	-85 dBm			
TX Characteristics	Min.	Typ.	Max.	Unit
Power Level (±2 dBm)		18		dBm
EVM (≤-9 dB)		-22		dB

3）RF parameters（IEEE802.11g）

Items	Contents			
Specification	IEEE802.11g			
Mode	OFDM 54Mbps			
Channel frequency	2400 ~ 2483.5MHz			
Freq.Error(±15ppm)	±10 ppm			
RX (PER≤-65dBm@10%)	-73 dBm			
TX Characteristics	Min.	Typ.	Max.	Unit
Power Level (±2dBm)		15		dBm
EVM (≤-25)		-30		dB

4）RF parameters （IEEE802.11n(BW20_MCS7)）

Items	Contents
Specification	IEEE802.11n BW20_MCS7
Mode	BW20_MCS7 65 Mbps
Channel frequency	2400 ~ 2483.5MHz
Freq.Error(±15ppm)	±10 ppm

RX (PER≤-64dBm@10%)	-72 dBm			
TX Characteristics	Min.	Typ.	Max.	Unit
Power Level (±2dBm)		15		dBm
EVM (≤-28)		-30		dB

7. Package Size and Pin Definition
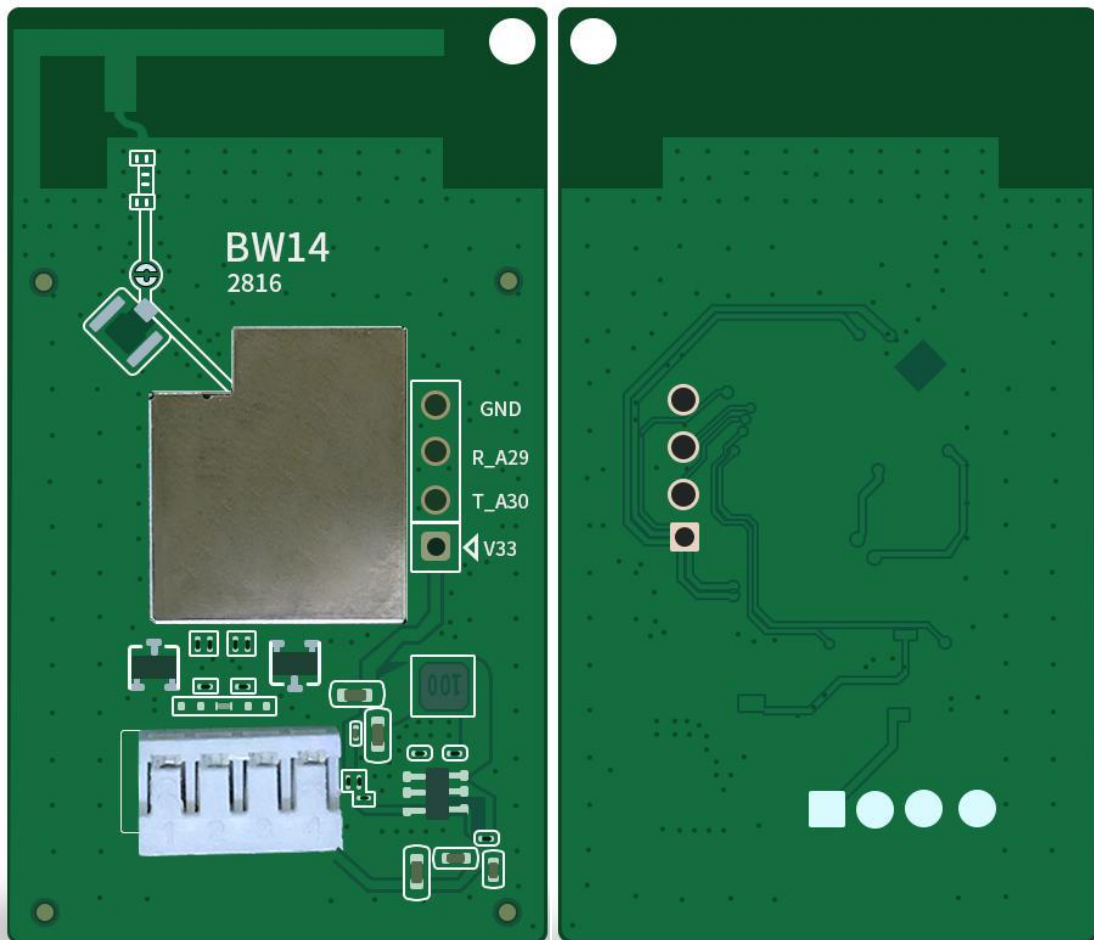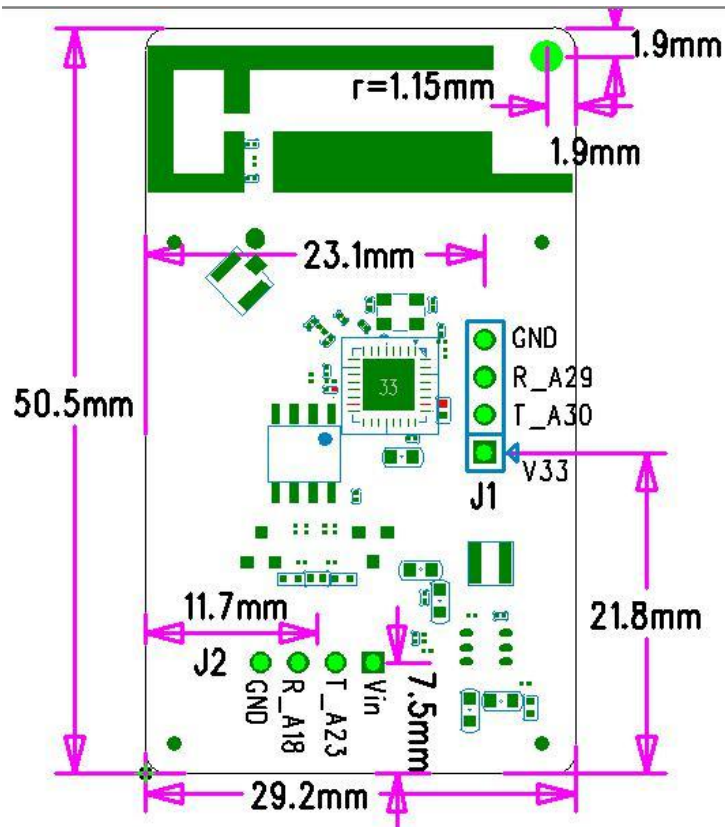
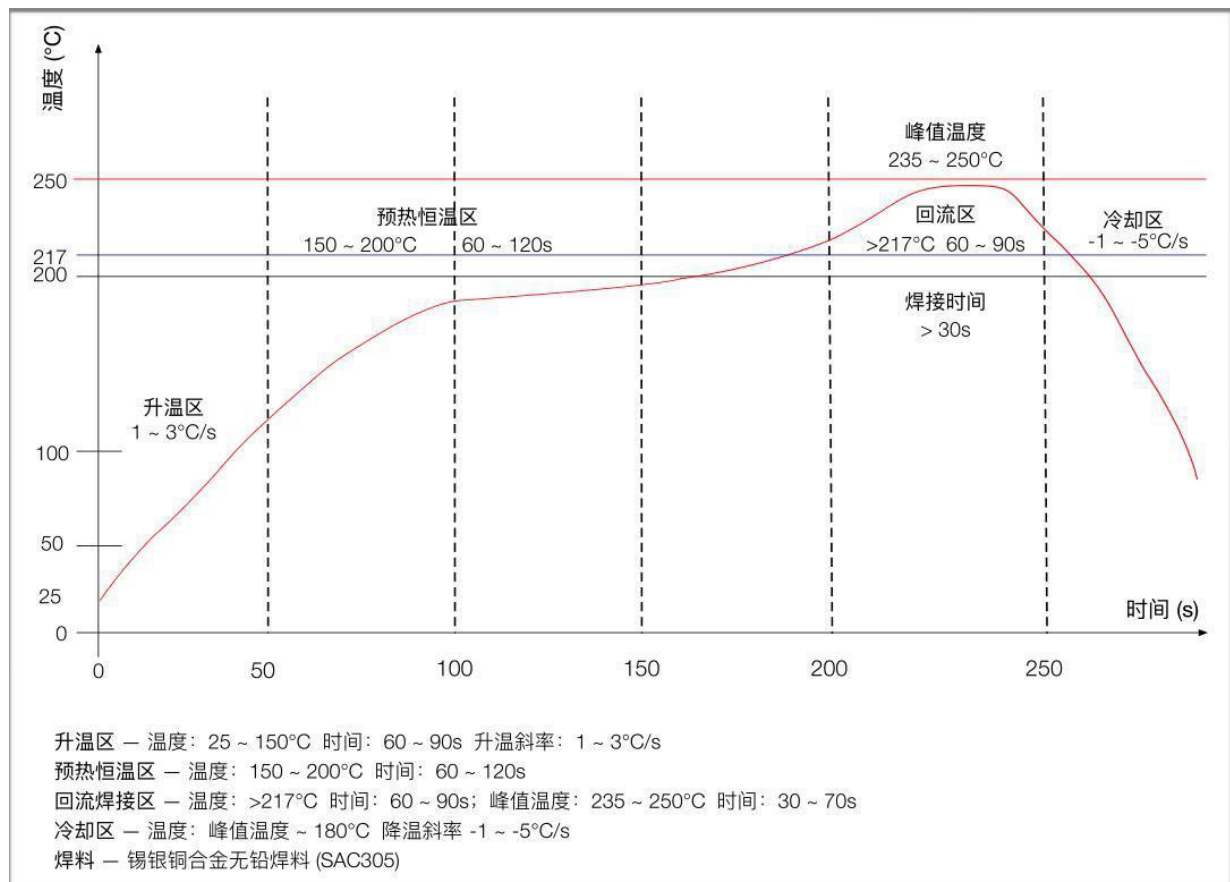| Pin No.	Definition		Description
J1	GND	-	GND
	R_A29	I	RTL8710BX GPIOA_29:LOG_UART,RXD(TTL:3.3V)
	T_A30	O	RTL8710BX GPIOA_30:LOG_UART:TXD(TTL:3.3V)
	V33	-	3.3V Power(For Test)
J2	GND	-	GND
	R_A18	I	Referred to RTL8710BX GPIOA_18: UART0_RXD(TTL:5V-12V)
	T_A23	O	Referred to RTL8710BX GPIOA_23: UART0_TXD(TTL:5V-12V)
	VIN	-	Power In(5V-12V)

8.Design guidance

1) Power reference design: current greater than 5 V, less than 12 V
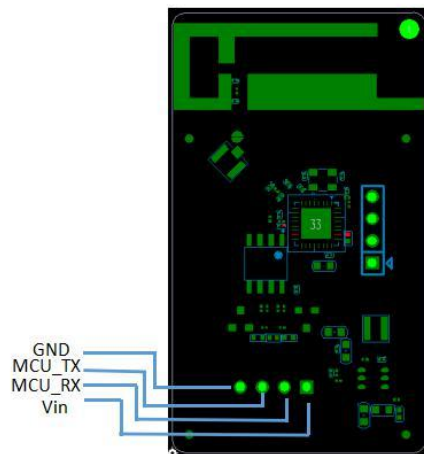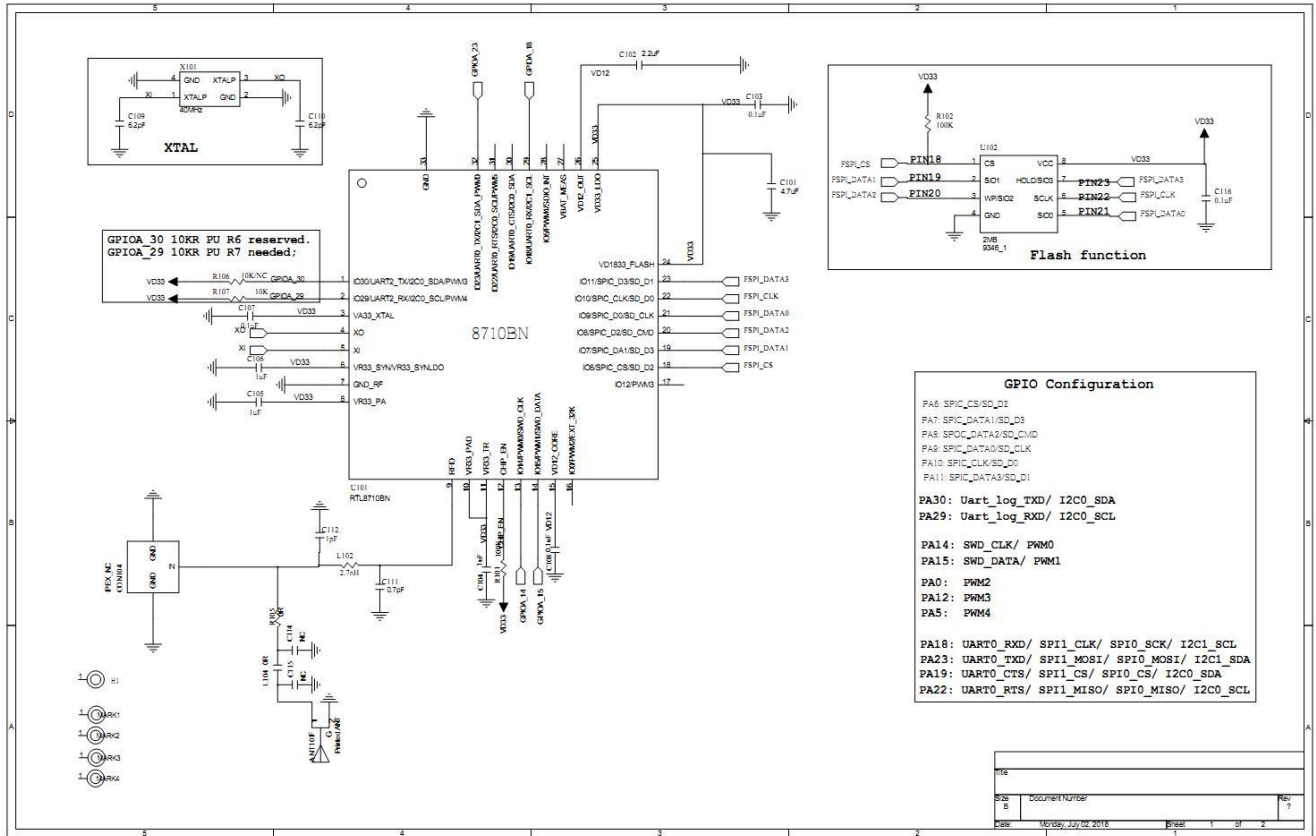
2)Module placement on the motherboard (see below):1, the recommended antenna part beyond the motherboard edge ;2, antenna part PCB hollowed;
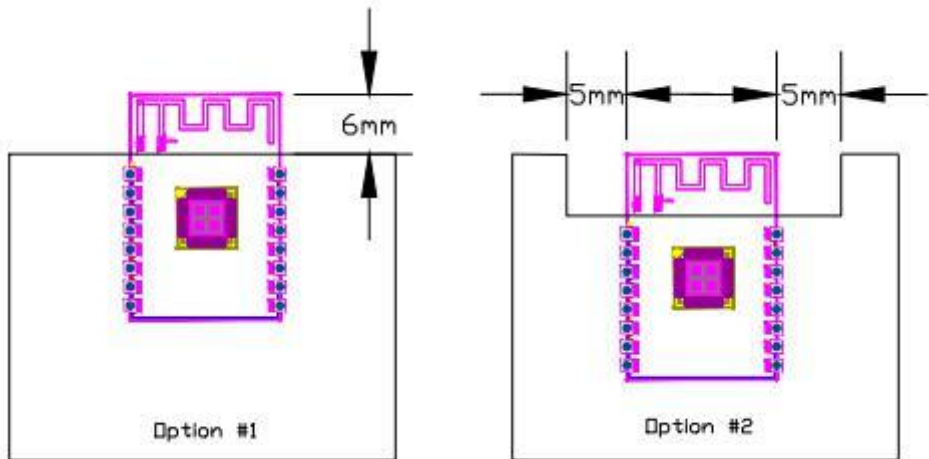
9.Reflow soldering curve

升温区 — 温度：25 ~ 150℃ 时间：60 ~ 90s 升温斜率：1 ~ 3℃/s
预热恒温区 — 温度：150 ~ 200℃ 时间：60 ~ 120s
回流焊接区 — 温度：>217℃ 时间：60 ~ 90s；峰值温度：235 ~ 250℃ 时间：30 ~ 70s
冷却区 — 温度：峰值温度 ~ 180℃ 降温斜率 -1 ~ -5℃/s
焊料 — 锡银铜合金无铅焊料 (SAC305)

10. Package information

BW14 is in electrostatic bag packing.