Specifications

SINGLE-CHIP 802.11b/g/n 1T1R WLAN

WiFi SoC Module

BW12

Version：V 1.0

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Document development / revision / revocation resume

Version	Date	Development/revision	Development	Approval
V1.0	2018.8.23	First edition	Guang Ning	Yang Xiaofei

1.Product Overview

BW12 is a high integration WIFI SOC modules. RTL8710BX main chip is a low - power chip, With a ARM-CM4F MCU, built in with WLAN、MAC、1T1R - supported WLAN and RF basebands, And provides a set of configurable GPIO ports, for the control of different peripherals.

BW12 a fully functional WIFI protocol, embedded memory and also equipped with simple application development.

2.Characteristics

- SMT-16 PIN (24mmx16mm)
- Chip integration CMOS MAC、 RF and PHY baseband, compatible with WLAN 802.11 b/g/n protocol.
- 2.4 GHz solution with 802.11 n
- compatible 802.11 n specification

- 802.11b/g/n compatible WLAN
- 802.11e QoS Enhancement (WMM)
- 802.11i (WPA, WPA2). Open, shared key, and pair-wise key authentication services
- WIFI WPS support
- WIFI Direct support

- Light Weight TCP/IP protocol

WLAN Physical characteristics

- 802.11n OFDM
- One transmit one receive (1T1R)
- 20MHz transmit bandwidth
- Short protection intervals (400ns)
- DSSS 、 DBPSK 、 DQPSK、CCK the short sequence and long sequence modulation are adopted.
- OFDM modulated with BPSK、QPSK、16QAM and 64QAM ，convolutional coding rate:1/2、 2/3、3/4 和 5/6
- Maximum data rate 54Mbps (802.11g) and 72.2Mbps (802.11n)

Outside interface

- One UART interface
- One support standard baud rate UART interface
- Two I2C and UART interfaces can shared
- One SPI interface and UART interface shared
- One SPI interface supports 10.4 MHz baud rate
- 5 PWM interface
- 1 SWD interface
- All above interfaces can be used as GPIO

3. Application

- M2M
- Radio Frequency Identification
- Sensor

4. Specification

Model	BW12
Product type	SoC WIFI module
Chip	RTL8710BX
Support protocol	802.11b/g/n
Interface	UART,I2C, SPI, GPIO, SWD, PWM
Standard voltage	3.3±10%V
Operating temperature	-20~+85° C ambient temperature
Storage temperature	-40 ~125° C ambient temperature
Working humidity	5 to 93 % maximum (non-condensing)
Dimension	24 x16x 3mm (LxWxH) ±0.2mm

5. Block diagram

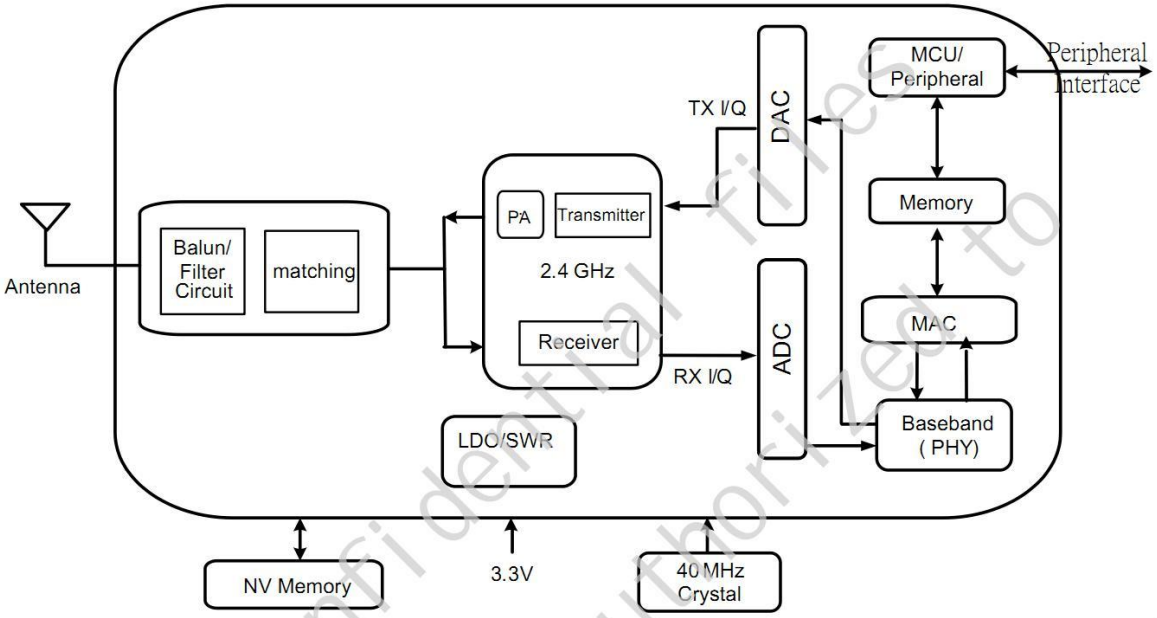


Figure 7 Single-Band 11n (1x1) Solution

6. Electrical parameters

1) DC Characteristics

Current Consumption	Min.	Typ.	Max.	Unit
DC 3.3V	-	50	300	mA

2) RF Characteristics for IEEE802.11b（802.11b 的 RF 特性）

Items	Contents			
Specification	IEEE802.11b			
Mode	CCK 11 Mbps			
Channel frequency	2412 ~ 2484 MHz			
Freq.Error(±15ppm)	±10 ppm			
RX (PER≤-76dBm@8%)	-85 dBm			
TX Characteristics	Min.	Typ.	Max.	Unit
Power Level (dBm)		18		dBm
EVM (≤-9 dB)		-22		dB

3) RF Characteristics for IEEE802.11g （802.11g 的 RF 特性）

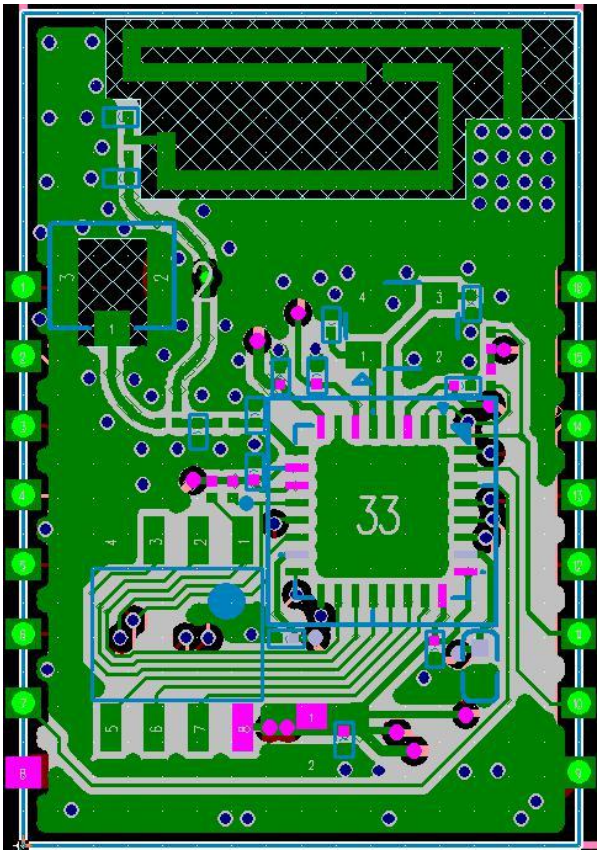
Items	Contents			
Specification	IEEE802.11g			
Mode	OFDM 54Mbps			
Channel frequency	2412 ~ 2484 MHz			
Freq.Error(±15ppm)	±10 ppm			
RX (PER≤-65dBm@10%)	-73 dBm			
TX Characteristics	Min.	Typ.	Max.	Unit
Power Level (dBm)		16		dBm
EVM (≤-25)		-30		dB

4) RF Characteristics for IEEE802.11n (BW20_MCS7)

（802.11n 的 RF 特性）

Items	Contents			
Specification	IEEE802.11n BW20_MCS7			
Mode	BW20_MCS7 65 Mbps			
Channel frequency	2412 ~ 2484 MHz			
Freq.Error(±15ppm)	±10 ppm			
RX (PER≤-64dBm@10%)	-72 dBm			
TX Characteristics	Min.	Typ.	Max.	Unit
Power Level (dBm)		15		dBm
EVM (≤-28)		-30		dB

7. Package Size and Pin Definition



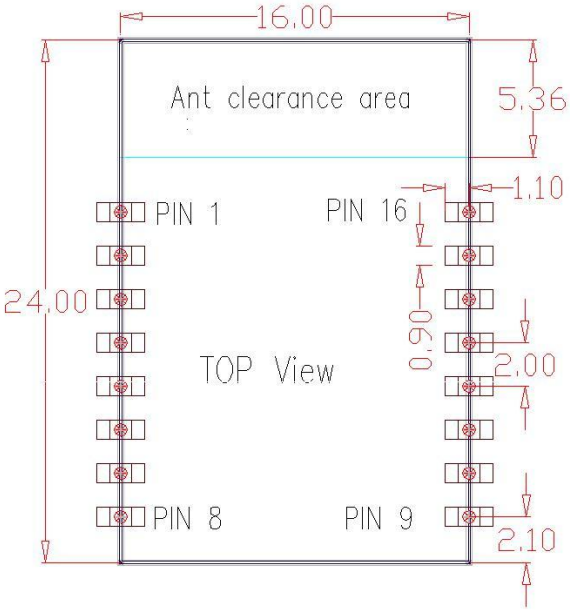


Fig. Module front view

引脚号	定义	I/O口	描述
1	GPIOA_15	IO	GPIO pin. The MUX function can be referred to Pin Function Table
2	VBAT_MEAS	NA	Reserved
3	CHIP_EN	I	Enable chip. 1: enable chip; 0: shutdown chip
4	GPIOA_5	IO	GPIO pin. The MUX function can be referred to Pin Function Table
5	GPIOA_29	IO	GPIO pin. The MUX function can be referred to Pin Function Table
6	GPIOA_0	IO	GPIO pin. The MUX function can be referred to Pin Function Table
7	GPIOA_19	IO	GPIO pin. The MUX function can be referred to Pin Function Table
8	VDD33	Power	3.3V INPUT,300mA MAX
9	GND	GND	GND
10	GPIOA_22	IO	GPIO pin. The MUX function can be referred to Pin Function Table
11	GPIOA_30	IO	GPIO pin. The MUX function can be referred to Pin Function Table
12	GPIOA_14	IO	GPIO pin. The MUX function can be referred to Pin Function Table
13	GPIOA_12	IO	GPIO pin. The MUX function can be referred to Pin Function Table
14	GPIOA_15	IO	GPIO pin. The MUX function can be referred to Pin Function Table
15	GPIOA_18	IO	GPIO pin. The MUX function can be referred to Pin Function Table
16	GPIOA_23	IO	GPIO pin. The MUX function can be referred to Pin Function Table

IO 口功能总表										
PIN name	UART	SPI Master	SPI Slave	SPI Flash	I2C	SDIO	PWM/TIMER	EXT32K	I2S	Others
GPIOA_14							PWM0	SWD_CLK		
GPIOA_15							PWM1	SWD_DATA		
GPIOA_0							PWM2	ext_32k		
GPIOA_12							PWM3			
GPIOA_6				SPIC_CS		SD_D2				
GPIOA_7				SPIC_DATA1		SD_D3				
GPIOA_8				SPIC_DATA2		SD_CMD				
GPIOA_9				SPIC_DATA0		SD_CLK				
GPIOA_10				SPIC_CLK		SD_D0				
GPIOA_11				SPIC_DATA3		SD_D1				
GPIOA_5						SDIO_SIDEBAND_INT	PWM4			WAKEUP_1
GPIOA_18	UART0_RXD	SPI1_CLK	SPI0_SCK		I2C1_SCL	SD_D2	TIEMER4_TRIG		I2S_MCK	WAKEUP_0
GPIOA_19	UART0_CTS	SPI1_CS	SPI0_CS		I2C0_SDA	SD_D3	TIEMER5_TRIG		I2S_SD_TX	ADC1
GPIOA_22	UART0_RTS	SPI1_MISO	SPI0_MISO		I2C0_SCL	SD_D0	PWM5		I2S_WS	WAKEUP_2
GPIOA_23	UART0_TXD	SPI1_MOSI	SPI0_MOSI		I2C0_SDA	SD_D1	PWM0			WAKEUP_3
GPIOA_30	UART2_log_TX				I2C0_SDA		PWM3	RTC_OUT		
GPIOA_29	UART2_log_RX				I2C0_SCL		PWM4			