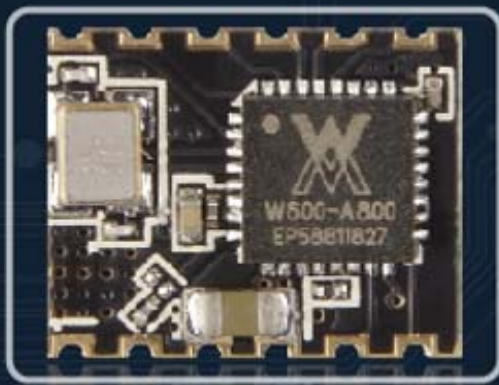


Air602 Hardware Design Manual

V1.0



Air602 WiFi
Module



Air602 WiFi
Development Board

Created by Luat, translated by seed





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1 Overview

The Air602 is a Wi-Fi reference design module based on the embedded Wi-Fi SoC chip (W600). Stamp hole interface, small size, easy to develop. This module is suitable for IoT applications such as smart home appliances, wireless audio and video, smart toys, medical monitoring, industrial control. This specification specifies the technical standards for the physical characteristics, technical specifications, communication protocols, product functions, performance, stability, environmental adaptability, and safety of the module.

2 Features

2.1 Interface

- Stamp hole interface, spacing 2mm
- 2 UART interfaces, support RTS/CTS, baud rate range 1200bps ~ 2Mbps
- 1 high speed SPI device controller with operating clock range 0 ~ 50MHz
- Integrated GPIO controller

2.2 Wireless

- Support IEEE802.11 b/g/e/i/d/k/r/s/w/n
- Support frequency range : 2.4~2.4835 GHz
- Support Wi-Fi WMM/WMM-PS/WPA/WPA2/WPS
- Support Wi-Fi Direct
- Support EDCA channel access method
- Support 20/40M bandwidth working mode
- Support STBC, GreenField, Short-GI, support reverse transmission
- Support RIFS frame interval



- Support AMPDU、 AMSDU
- Support IEEE802.11n MCS 0~7, MCS32 physical layer transmission rate, transmission rate up to 150Mbps
- Short Preamble support at 2/5.5/11 Mbps rate transmission
- Support HT-immediate Compressed Block Ack、 Normal Ack、 No Ack response method
- Support CTS to self
- Support STA/AP/AP+STA function
- In the BSS network, multiple multicast networks are supported, and each multicast network is supported in different encryption modes. It can support up to 32 multicast networks and incoming STA encryption.
- When the BSS network is used as an AP, the total number of supported sites and groups is 32, and 16 sites are supported in the IBSS network.

3. Others

- Support for user-programmable GPIO control
- Supports AT+ instruction protocol based on ASCII encoding (UART interface)
- Support multiple network protocols : TCP/UDP/ICMP/DHCP/DNS/HTTP
- Support DHCP Server、 DNS Server
- Support for scalable WEB servers
- Support firmware online upgrade

3 Specification

Table 3-1 Product specification list

	Item	Parameter	Note
Wireless	Support Wi-Fi Mode	IEEE802.11b/g/n	
	RF system impedance	50Ω	
	SWR	<-10dB	
	Frequency Range	2.4~2.4835 GHz	
	Receiving sensitivity	20MHz MCS7@-71dBm; 40MHz MCS7@-68dBm; 54Mbps@-73dBm; 11Mbps@-86dBm; 1Mbps@-95dBm;	
	Physical layer data rate	802.11n MCS 0~7 150Mbps	
	Modulation	DSSS、OFDM、DBPSK、DQPSK、CCK、QAM16/64	
	Output Power	IEEE802.11b, DSSS 1Mbps, POUT = +17dBm; IEEE802.11g, OFDM 54Mbps, POUT = +10dBm; IEEE802.11n, OFDM MCS7, POUT = +10dBm;	
Antenna interface	Stamp hole		
Hardware	Interface Type	UART、SPI、GPIO	
	Interface rate	2Mbps@UART (Max) 50Mbps@SPI (Max)	
	Operating Voltage	3.3V	
	Operating current	110mA (PS Mode 35mA, DTIM = 1)	
	Operating humidity	5%~90% (No condensation)	
	storage temperature	-40~+125 °C	
	Operating temperature	-40~+85°C	
Dimensions	10mm×12mm		
Software	Network Type	STA/AP/AP+STA/Wi-Fi Direct	
	Verification	WEP/WPA-PSK/WPA2-PSK	
	Encryption	WEP64/WEP128/TKIP/CCMP(AES)	
	WPS Function	WPS	
	Energy saving	PS-POLL/Standby	
	Network protocol	TCP/UDP/ARP/ICMP/DHCP/DNS/HTTP	
	Interface Protocol	AT+ instruction set	

4 External antenna specifications

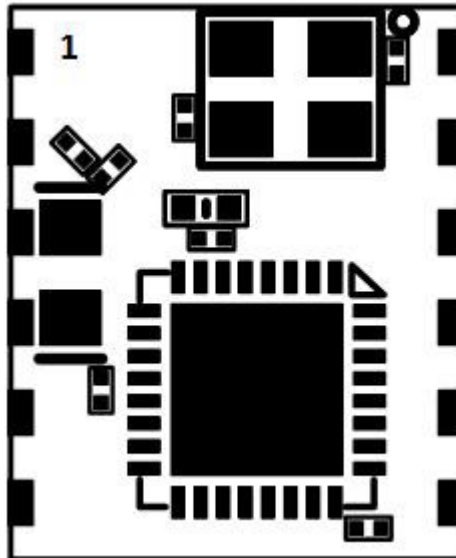
Table 4-1 Recommended specifications for purchased antennas

Item	description
Frequency Range	2.4~2.4835 GHz
impedance	50 Ω
Voltage standing wave ratio	≤ 1.5
Polarization mode	Linear polarization
Interface	IPX

5 Pin Out

The module Air602 is shown in Figure 5-1:

Figure 5-1



The module pin description is shown in Table 5-1:

Table 5-1

Pin Number	Pin Name	Type	Default pin function	Pin multiplexing
1	GND	P	GND	
2	ANT	ANT	antenna	
3	GND	P	GND	
4	VCC	P	3.3V power supply	
5	PA_4	I/O	UART0_TX	
6	PA_5	I/O	UART0_RX	
7	PB_8	I/O	GPIOPB_8	H_SPI_CK
8	PB_9	I/O	UART1_CTS	H_SPI_INT
9	PB_10	I/O	UART1_RTS	H_SPI_CS
10	PB_11	I/O	UART1_RX	H_SPI_DI
11	PB_12	I/O	UART1_TX	H_SPI_DO
12	RST	I	Low level reset	

6 Environmental adaptability

6.1 Low temperature working test

- Reference standard : GB/T 2423.1-2001;
- Under the condition of ambient temperature of $-40\pm 1^{\circ}\text{C}$, the NIC module sample can work continuously for 72 hours, and the performance and function remain good after the test.

6.2 Low temperature storage test

- Reference standard : GB/T 2423.1-2001
- The NIC module sample was placed for 72 hours at an ambient temperature of -40°C . The performance and function remained good after the test.

6.3 High temperature working test

- Reference standard : GB/T 2423.2-2001

- At an ambient temperature of $85 \pm 1^\circ \text{C}$, the NIC module sample can work continuously for 72 hours, and the performance and function remain good after the test.

6.4 High temperature storage test

- Reference standard : GB/T 2423.2-2001
- The NIC module sample was placed for 72 hours at an ambient temperature of 125°C . The performance and function remained good after the test.

6.5 Vibration test

- Reference standard : GB/T 4798.5-2007
- Random vibration, vibration direction: X, Y, Z axis, displacement, frequency refer to GBM 4798.5-2007 5M3 grade, vibration time: 60min per axis. For detailed test methods, please refer to the 5M3 rating in GB/T 4798.5-2007.

6.6 Environmental certification

- Compliant with RoHS IEC62321-1:2013 standard

7 Module reference circuit design

Figure 7-1 Air602 reference circuit design

