WMIOT601 Specification

V1.0.0

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Document history

Version	Completion Date	Revision Record	Author	Auditor	Approver
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Content

1 Summary

WMIOT601 is a Wi-Fi reference design module based on embedded Wi-Fi SoC chip (W600), which has stamp hole interface, small size and is easy to develop. The module can be easily applied to smart appliances, smart home, health care, smart toy, and wireless audio & video, industrial and other IoT fields. This specification provides technical standards for the physical properties, technical specifications, communication protocols, product functions, performance, stability, environmental adaptability, and security of the module.

2 Features

2.1 Interface

- stamp hole interface, spacing 2.0mm
- Integrated 2 UART interface, support RTS/CTS, baud rate: 1200bps~2Mbps
- Integrated one high speed SPI controller, operating frequency: 0~50MHz
- Integrated PWM controller, Max output frequency is 20MHz and max input frequency is 20MHz
- Integrated GPIO controller

2.2 Wi-Fi

- Support GB15629.11-2006、IEEE802.11 b/g/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
- Support 20/40M bandwidth
- Support STBC, Greenfield, Short-GI and reverse transmission
- Support RIFS interframe space
- Support AMPDU、AMSDU
- Support IEEE802.11n MCS 0~7, MCS32, transmission rate is up to 150Mbps
- Support Short Preamble in 2/5.5/11Mbps
- Support HT-immediate Compressed Block Ack, Normal Ack, No Ack
- Support CTS to self
- Support STA/AP/AP+STA function
- Support up to 32 multicast networks with different encryption methods in BSS
- As AP in BSS, the sum of sites and groups is up to 32 and in IBSS is up to 16

2.3 Others

- Programmable GPIO control signals
- Support AT+ instruction protocol(UART interface) base on ASCII（UART 接口）
- Support network protocol: TCP/UDP/ICMP/DHCP/DNS/HTTP
- Support DHCP Server, DNS Server
- Support extensible WEB server
- Support firmware on line update

3 Specification

Table 3-1 product specification list

	item	parameter	comment
Wi-Fi	Support Wi-Fi protocol	IEEE802.11b/g/n	
	RF system impedance	50Ω	
	SWR	<-10dB	
	Frequency range	2.4~2.4835 GHz	
	Reception sensitivity	20MHz MCS7@-71dBm; 40MHz MCS7@-68dBm; 54Mbps@-73dBm; 11Mbps@-86dBm; 1Mbps@-95dBm;	
	Data rate in PHY	802.11n MCS 0~7 150Mbps	
	Modulation mode	DSSS、OFDM、DBPSK、DQPSK、CCK、QAM16/64	
	Output power	IEEE802.11b, CCK 11Mbps, POUT = +19 dBm; IEEE802.11g, OFDM 54Mbps, POUT = +13.5 dBm; IEEE802.11n, OFDM MCS7, POUT = +12dBm;	
	Antenna interface	IPX	3mm x 3mm
Hardware	Interface	SDIO、UART、SPI、GPIO、I²C、PWM、I²S、7816	
	Data rate	2Mbps@UART (Max) 50Mbps@SPI (Max)	
	Working voltage	3.3V	
	Working current	Average 75mA	
	Working humidity	5%~90%（no condensation）	
	Storage temperature	-40~+125 ℃	

	Working temperature	-40~+85℃	
	Size	20mm×15mm	
Software	Network type	STA/AP/AP+STA/Wi-Fi Direct	
	Authentication	WEP/WPA-PSK/WPA2-PSK	
	Encryption	WEP64/WEP128/TKIP/CCMP(AES)	
	WPS	WPS	
	Energy conservation	PS-POLL/Standby	
	Network protocol	TCP/UDP/ARP/ICMP/DHCP/DNS/HTTP	
	Interface protocol	AT+ instruction	

4 Antenna specification

Table 4-1 recommended specification for external antenna

item	comment
Frequency range	2.4~2.4835 GHz
Impedance	50 Ω
Voltage standing-wave ratio	≦1.5
Polarization	Linear polarization
Interface	IPX

5 Interface signals

WMIOT601 is shown in Figure 5-1:

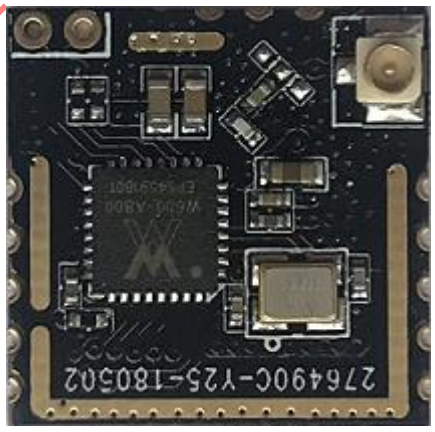

Figure 5-1 WMIOT601

The module size and its pin arrangement is shown in Figure 5-2:

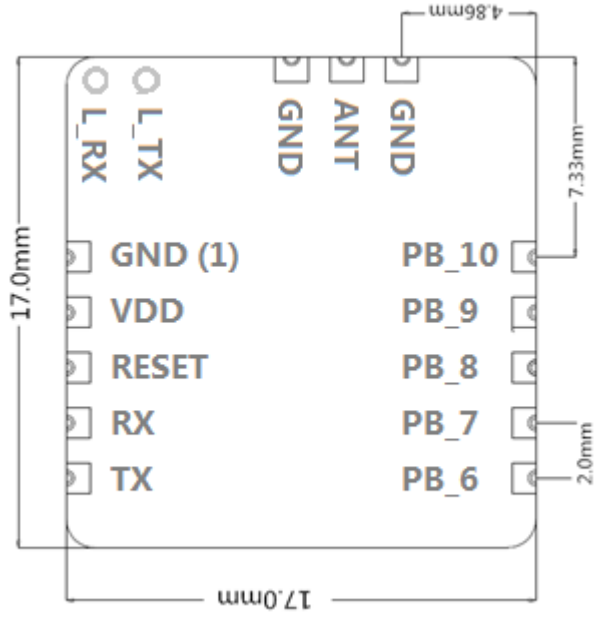

Figure 5-2 Pin configuration

The pin description is shown in Table 5-1:

Table 5-1 Pin Description

Pin No.	Pin Name	Type	Default function description	Multi-Function
1	GND	P	GND	
2	VDD	P	3.3V power supply	
3	RESET	I	RESET	
4	PB_11	I/O	UART1_RX	H_SPI_DI/GPIOPB_11
5	PB_12	I/O	UART1_TX	H_SPI_DO/GPIOPB_12
6	PB_6	I/O	GPIOPB_6	PWM_4
7	PB_7	I/O	GPIOPB_7	
8	PB_8	I/O	GPIOPB_8	H_SPI_CK
9	PB_9	I/O	UART1_CTS	H_SPI_INT/GPIOPB_9
10	PB_10	I/O	UART1_RTS	H_SPI_CS/GPIOPB_10
11	GND	P	GND	
12	ANT	ANT	ANT optional	

13	GND	P	GND	
14	L_TX	I/O	UART0_TX	
15	L_RX	I/O	UART0_RX	

6 Environmental adaptability

6.1 Low temperature working test

- Reference standard: GB/T 2423.1-2001;
- Under the ambient temperature is -40±1℃, the sample of the module can continuously work for 72 hours, and all the functions and functions are well maintained after the test.

6.2 Low temperature storage test

- Reference standard: GB/T 2423.1-2001
- Under the ambient temperature of -40℃, the sample of the module is placed for 72 hours, and all the functions and functions are well maintained after the test.

6.3 High temperature working test

- Reference standard: GB/T 2423.2-2001
- Under the ambient temperature is 85±1℃, the sample of the module can continuously work for 72 hours, and all the functions and functions are well maintained after the test.

6.4 High temperature storage test

- Reference standard: GB/T 2423.2-2001
- Under the ambient temperature of 125℃, the sample of the module is placed for 72 hours, and all the functions and functions are well maintained after the test.

6.5 Vibration test

- Reference standard: GB/T 4798.5-2007
- Random vibration, vibration direction: X, Y and Z axis, displacement and frequency refer to 5M3 level in GB/T 4798.5-2007, vibration time: each axis 60min. In detail, please refer to 5M3 level in GB/T 4798.5-2007.

6.6 Environment protection certificate

- Conform to the RoHS IEC62321-1:2013 standard

7 Reference design

The reference design is shown in Figure 7-1:

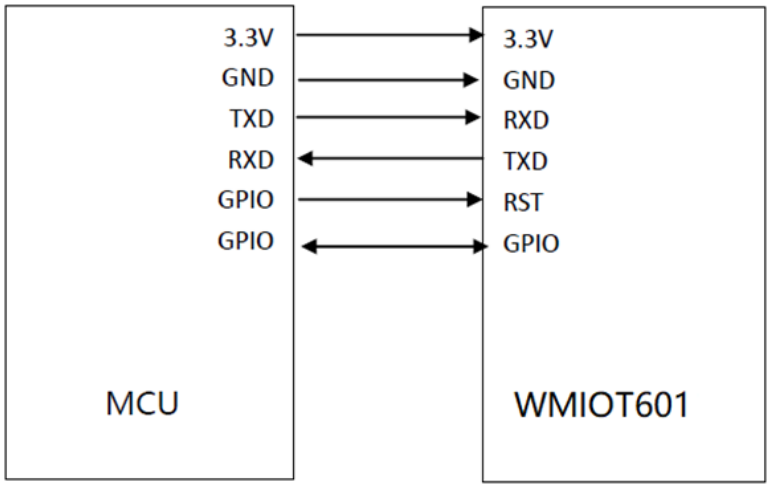

Figure 7-1 WMIOT601 reference design

FCC WARNING

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.

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

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 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.

To maintain compliance with FCC’s RF Exposure guidelines, This equipment should be installed and operated with minimum distance between 20cm the radiator your body: Use only the supplied antenna.