

WMIOT604 Specification

V1.0.0

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Document History

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1 Summary

WMIOT604 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 1.5mm
- 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/input frequency 20MHz
- Integrated I²C controller
- Integrated I²S controller
- Integrated GPIO controller

2.2 Wi-Fi

- Support GB15629.11-2006、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
- 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
- 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@-87dBm; 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, DSSS 1Mbps, POUT = +17dBm; IEEE802.11g, OFDM 54Mbps, POUT = +12dBm; IEEE802.11n, OFDM MCS7, POUT = +10dBm;	
Hardware	Interface	UART, SPI, GPIO, PWM, I ² C, I ² S	
	Data rate	2Mbps@UART (Max) 50Mbps@SPI (Max)	
	Working voltage	3.0V – 3.6V	
	Working current	20mA~110mA	
	Working humidity	5%~90% (no condensation)	
	Storage temperature	-40~+125 °C	
	Working temperature	-40~+85°C	

	Size	15.0mm×20.0mm	
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+ Command	

4 Interface Signals

The layout and dimension information of module pins are shown in Figure 5-1.

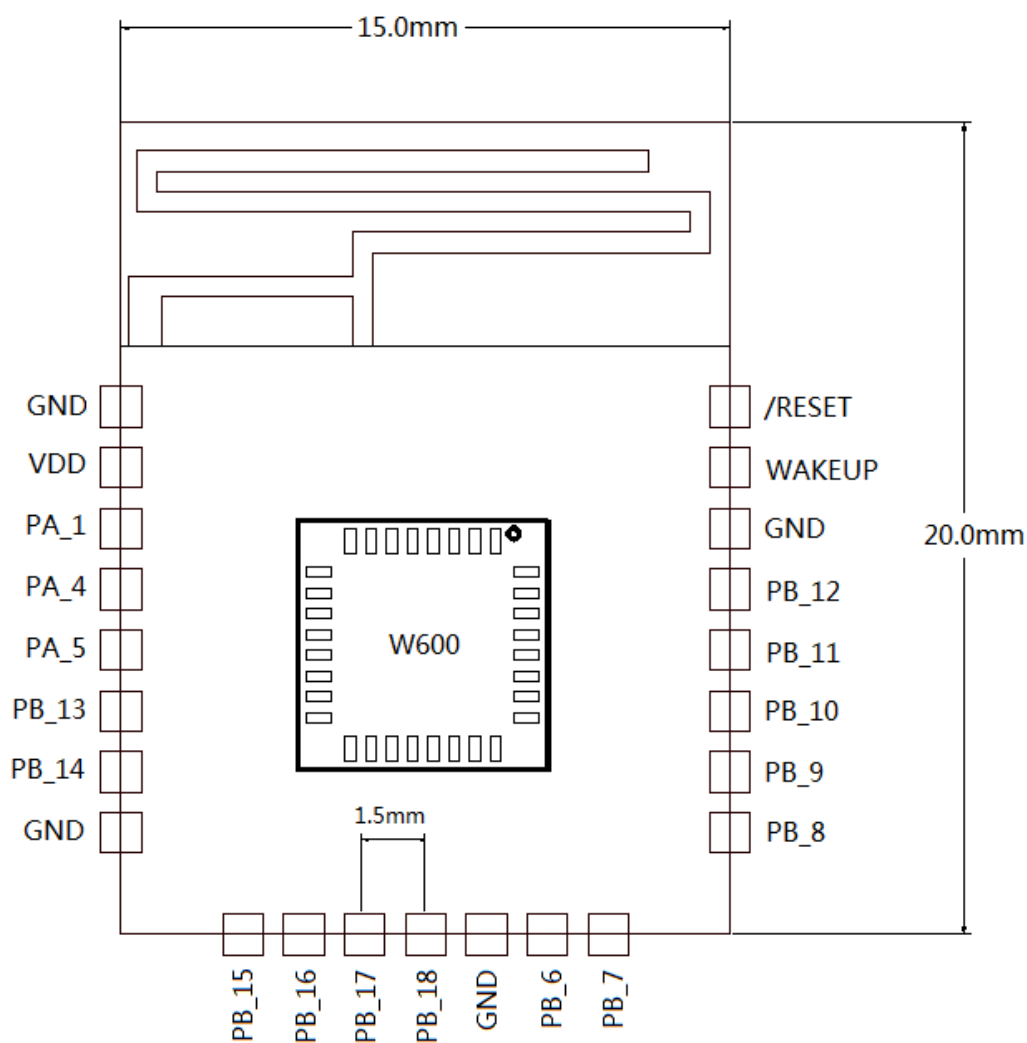


Figure 5-1 WMIOT604

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	
3	PA_1	I/O	Reserved	SIM_DATA、PWM_2、SPI(M/S)_CK、GPIOA_1
4	PA_4	I/O	UART0_TX	PWM_5、SPI(M/S)_DO、I ² S_M_SCL、GPIOA_4
5	PA_5	I/O	UART0_RX	PWM_1、SPI(M/S)_DI、I ² S_M_EXTCLK、GPIOA_5
6	PB_13	I/O	PWM_2	I ² C_SCL、SDIO_CMD、GPIOB_13
7	PB_14	I/O	H_SPI_INT	PWM_5、I ² C_DAT、I ² S_S_SDA、GPIOB_14
8	GND	P	GND	
9	PB_15	I/O	H_SPI_CS	PWM_4、SPI(M/S)_CS、I ² S_S_SCL、GPIOB_15
10	PB_16	I/O	H_SPI_CK	PWM_3、SPI(M/S)_CK、I ² S_S_RL、GPIOB_16
11	PB_17	I/O	H_SPI_DI	PWM_2、SPI(M/S)_DI、UART1_RX、GPIOB_17
12	PB_18	I/O	H_SPI_DO	PWM_1、SPI(M/S)_DO、UART1_TX、GPIOB_18
13	GND	P	GND	
14	PB_6	I/O	Reserved	SWDAT、UART0_RX、PWM_4、SIM_CLK、GPIOB_6
15	PB_7	I/O	Reserved	SWCK、UART0_TX、SDIO_CMD、SPI(M/S)_CS、GPIOB_7
16	PB_8	I/O	PWM_5	H_SPI_CK、SDIO_CK、I ² S_M_SCL、GPIOB_8
17	PB_9	I/O	UART1_CTS	H_SPI_INT、SDIO_DAT0、I ² S_M_SDA、GPIOB_9
18	PB_10	I/O	UART1_RTS	H_SPI_CS、SDIO_DAT1、I ² S_M_RL、GPIOB_10
19	PB_11	I/O	UART1_RX	H_SPI_DI、SDIO_DAT2、I ² C_SCL、GPIOB_11
20	PB_12	I/O	UART1_TX	H_SPI_DO、SDIO_DAT3、I ² C_DAT、GPIOB_12
21	GND	P	GND	
22	WAKEUP	I	WAKEUP	High Level Wake up
23	/RESET	I	RESET	Low Level Reset

5 Environmental adaptability

5.1 Low temperature working test

- Reference standard: GB/T 2423.1-2001;
- Under the ambient temperature is $-40\pm 1^{\circ}\text{C}$, the sample of the module can continuously work for 72 hours, and all the functions and functions are well maintained after the test.

5.2 Low temperature storage test

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

5.3 High temperature working test

- Reference standard: GB/T 2423.2-2001
- Under the ambient temperature is $85\pm 1^{\circ}\text{C}$, the sample of the module can continuously work for 72 hours, and all the functions and functions are well maintained after the test.

5.4 High temperature storage test

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

5.5 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.

5.6 Environment protection certificate

- Conform to the RoHS IEC62321-1:2013 standard

6 Reference design

The reference design is shown in Figure 6-1:

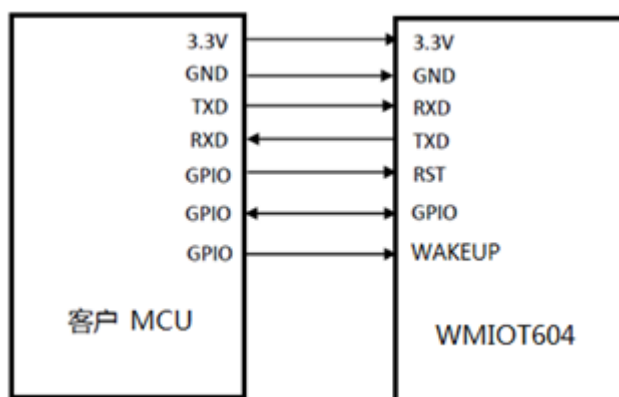


Figure 7-1 WMIOT604 reference design

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

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.

This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

15.105 Information to the user.

(b) For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

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.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

Radiation Exposure Statement:

This equipment complies with FCC 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.

The availability of some specific channels and/or operational frequency bands are country dependent and are firmware programmed at the factory to match the intended destination.

The firmware setting is not accessible by the end user.

The final end product must be labelled in a visible area with the following:

“Contains Transmitter Module 2AGQ7-WMIOT604”