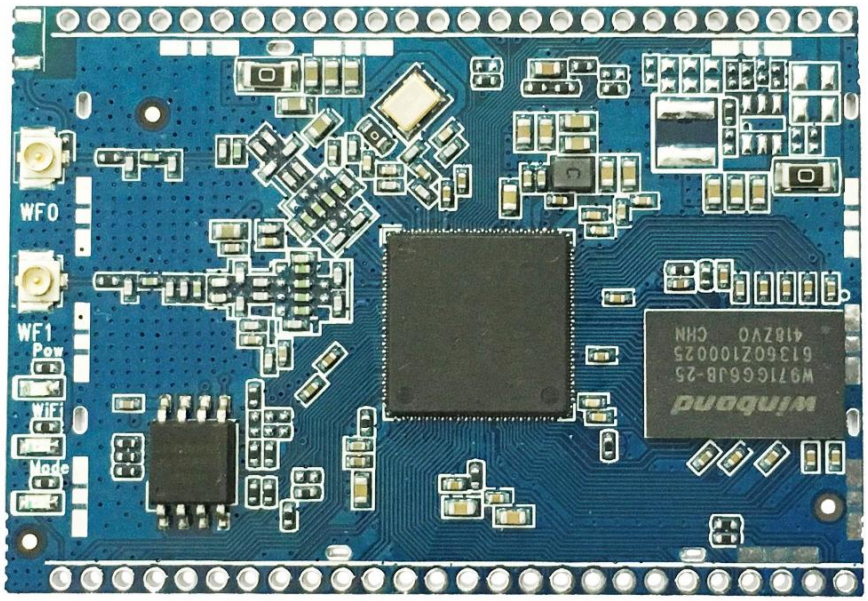
SYQ-MT7628/7688

WIFI Module

User manual

version: 1.4



Overview

This document mainly introduces the electrical characteristics, mechanical dimensions, pin definition and development supporting resources of the syq-mt7628/7688 WIFI module.

Supporting Development Board Version.

The development board version which is compatible with this module is as follows, and the corresponding development board can be purchased to speed up the development process.

Name	Version
DYQ-MT76X8	V1.1
YDH-MT76X8KIT	V1.2
LDS_MT76X8	V1.0

Applicable Scenario

This module is suitable for many scenarios, such as the following scenario.

- routing product
- DTU
- IOT
- Wireless communication
- WiFi AP

A Revision History

The revision record accumulates a description of each document update. The latest version of the document contains updates to all previous versions of the document.

Data	Version	Instructions
2017-09-30	V1.0	First release
2017-10-17	V1.1	Modify part error
2017-11-06	V1.2	Add some content
2018-02-06	V1.3	Modify part error
2018-04-02	V1.4	Increase rf parameters

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1、Instructions

1.1 Introduction Of The Module

The syq-mt7628/7688 WIFI module is a low-cost and low-power iot module based on MT7628/7688.The module supports Linux operating system, OpenWRT,LEDE and custom development, is the integration of 802.11 b/g/n WIFI solution, can be widely applied to intelligent devices and the application of cloud services, including cable, wireless cameras, hard, routers, wireless speakers, wireless AP storage, etc.

1.2 Main application areas

- IOT
- WiFi intelligent household
- WiFi intelligent household
- Industrial control
- Consumer electronics
- Wireless camera
- Hard AP
- Router
- Wireless speaker
- Wireless storage
- WiFi hotspot
- WiFi mobile power supply
- Wired network to WiFi.

1.3 Features

This module adopts MT7628NN/7688AN scheme, small size and stable performance.The main features are as follows.

(1) Super small volume, length and width is only 55mm x 38mm.

(2) 2.0mm pin interface for easy installation.

(3) Optional ceramic antenna and i-pex interface.

(4) 3.3V single power supply.

(5) Wired & wireless router scheme.

(6) Support 802.11b /g/n protocol, maximum 300/150mbps.

(7) Wired support 1WAN and 4LAN, 10M/100M self-adaptive.

(8) Moderate RF power consumption.

(9) Onboard 32-256mb DDR2 memory, 8-32mb FLash.

(10) 480Mbps high-speed USB interface.

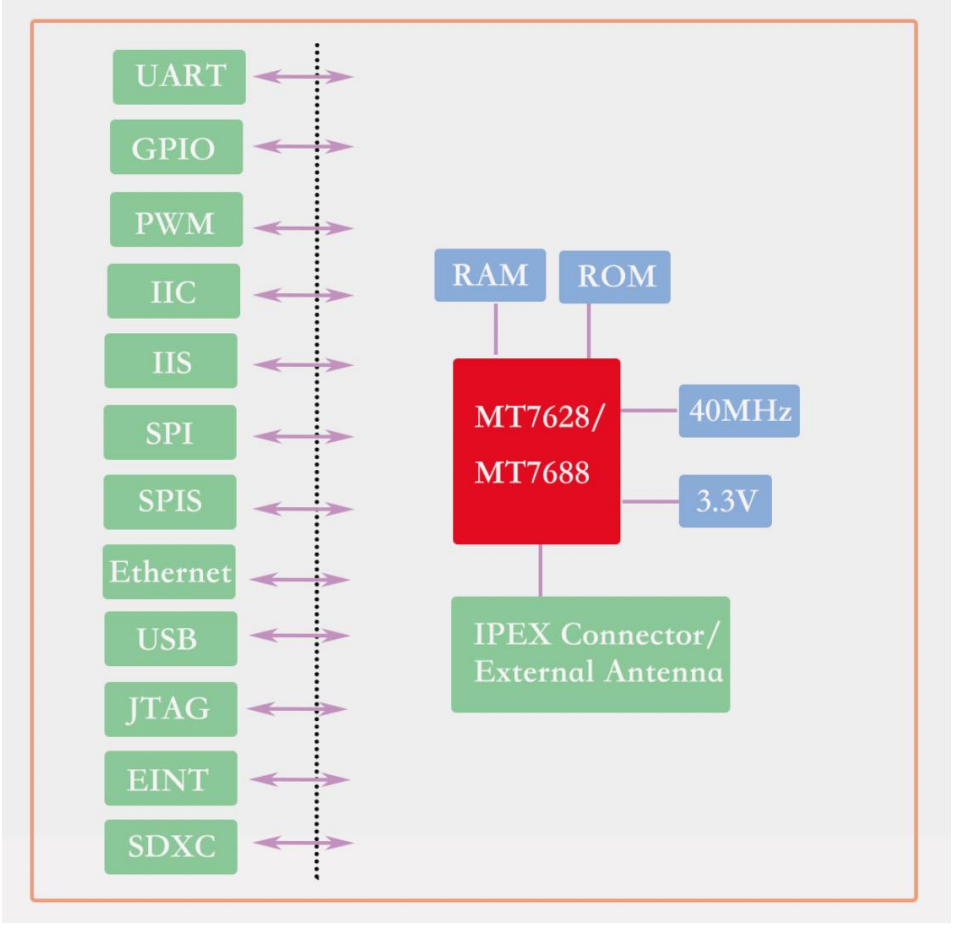
(11) 3 UART (UART0 for system Debug).

(12) TCP turns the serial port.

(13) Sd-xc, eMMC, PCM, IIS digital audio interface (192K/24bits), IIC communication interface, PWM, SPI master/slave.

(14) GPIO.

1.4 Diagram



1.5 Basic Parameter

classification	parameter	
Wireless parameters	Wireless rate	150Mbps OR 300Mbps
	Frequency range	2.4GHz-2.4835GHz
	Wireless standards	IEEE 802.11b/g/n
	Wireless options	I-pex connector OR onboard ceramic antenna.
	impedance	50Ω
Hardware parameters	Chipset	MT7628/MT7688
	Kernel	MIPS24KEc
	Basic frequency	580MHz
	RAM	DDR2 32MB,64MB,128MB,256MB
	Flash	8MB,16MB,32MB
	Data interface	UART、IIS、IIC、SPI、PWM、GPIO
	size	55mmX38mm
Board level software	Custom development	Provide SDK for customer secondary development.
	Wireless type	AP/STA/AP+STA
	Encryption type	WEP64/WEP128
	Security mechanism	WEP/WAP-PSK/WPA2-PSK/AES

This module supports onboard ceramic antenna and external antenna.When customers use a built-in antenna, note:

（1）keep the antenna away from the metal, at least 10mm spacing with the surrounding high components.

（2）the antenna part shall not be covered by metal shell, and the plastic shell shall be kept at least 10mm.

1.6 Electric Parameter

Item	condition	Min	Typ	Max	Unit
Operating temperature		-20		55	℃
Storage Temperature		-45		125	℃
Maximum welding temperature	IPC/JEDEC J-STD-020				℃
Operating voltage		2.97	3.3	3.62	V
Arbitrary I/O voltage		0		3.3	V
Electrostatic discharge (human model)	TAMB=25℃			2	KV
Electrostatic discharge (charging device model)	TAMB=25℃			2	KV

1.7 RF Parameter

1.7.1 802.11b 11M

802.11b Transmit (Conductive)					
Item	Condition	Min	Typ	Max	Unit
Frequency Range		Channel 1		Channel 11	
Tx Power Level	DQPSK	15.5	16	16.5	dBm
Frequency Tolerance		-1	0	1	ppm
MaskErr		0		5.12	%
EVM		-45		-20	dB
802.11b Receiver (Conductive)					
Item	Condition	Min	Typ	Max	Unit
Frequency Range		Channel 1		Channel 11	

Min. Input	11Mbps PER<8%	-91.5	-89.5	-87.5	dBm

1.7.2 802.11g 54M

802.11g Transmit (Conductive)					
Item	Condition	Min	Typ	Max	Unit
Frequency Range		Channel 1		Channel 11	
Tx Power Level	OFDM	15.5	16	16.5	dBm
Frequency Tolerance		-1	0	1	ppm
MaskErr		0		5.12	%
EVM		-45		-20	dB
802.11g Receiver (Conductive)					
Item	Condition	Min	Typ	Max	Unit
Frequency Range		Channel 1		Channel 11	
Min. Input	54Mbps PER<8%	-78.0	-76.0	-74.0	dBm

1.7.3 802.11n MCS7(HT20)

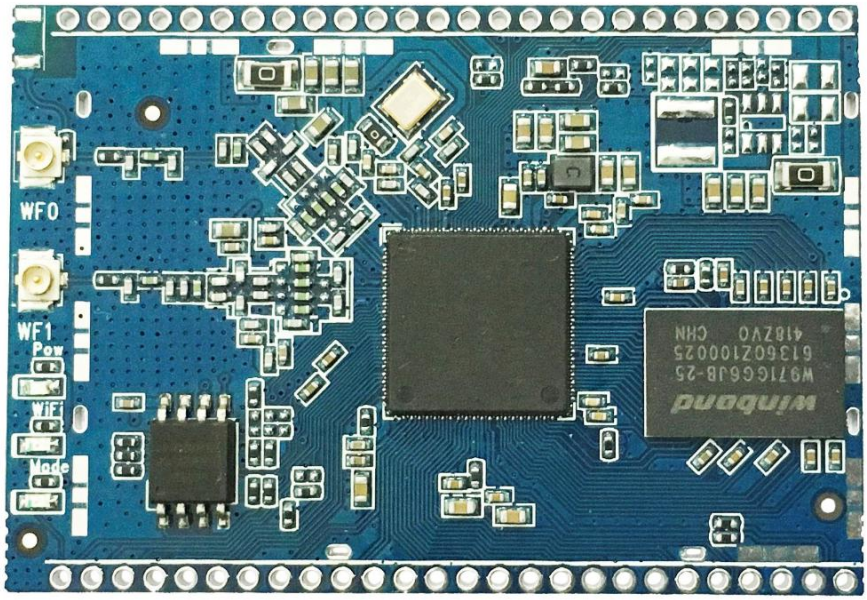
802.11n_HT20 Transmit (Conductive)					
Item	Condition	Min	Typ	Max	Unit
Frequency Range		Channel 1		Channel 11	
Tx Power Level	OFDM	15.5	16	16.5	dBm
Frequency Tolerance		-1	0	1	ppm
MaskErr		0		5.12	%

EVM		-45		-27	dB
802.11n_HT20 Receiver (Conductive)					
Item	Condition	Min	Typ	Max	Unit
Frequency Range		Channel 1		Channel 11	
Min. Input	MCS7 PER<10%	-76.5	-74.5	-72.5	dBm

1.7.1 802.11n_MCS7(HT40)

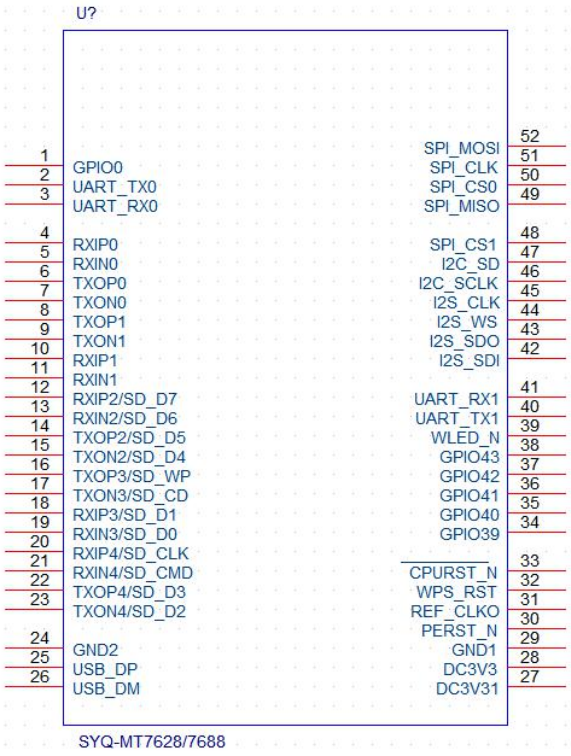
802.11n_HT40 Transmit (Conductive)					
Item	Condition	Min	Typ	Max	Unit
Frequency Range		Channel 1		Channel 11	
Tx Power Level	DQPSK	15.5	16	16.5	dBm
Frequency Tolerance		-1	0	1	ppm
MaskErr		0		5.12	%
EVM		-45		-27	dB
802.11n_HT40 Receiver (Conductive)					
Item	Condition	Min	Typ	Max	Unit
Frequency Range		Channel 1		Channel 11	
Min. Input	MCS7 PER<10%	-76.5	-74.5	-72.5	dBm

2、Module Definition



After the power supply, the voltage supply is normally blue, and the red light indicates that the WIFI startup is successful, that is, the system starts normally, and the green light corresponds to GPIO0 (GPIO mode is GPIO11) according to the system software setting.

2.1 Pin Definition



Pin	Name	Type	Note
1	GPIO0	I/O	GPIO,Connect to green light
2	*UART_TX0	0	UART0 send, 3.3V cmos level
3	UART_RX0	I	UART0 receive,Internal pull-down 10K resistance. 3.3V cmos level
4	RXIP0	I/O	WAN RX+
5	RXIN0	I/O	WAN RX-
6	TXOP0	I/O	WAN TX+
7	TXON0	I/O	WAN TX-
8	TXOP1/PWM_CH0	I/O	LINK0 TX+/PWM
9	TXON1/PWM_CH1	I/O	LINK0 TX-/PWM
10	RXIP1/UART_TXD2	I/O	LINK0 口 RX+/UART2
11	RXIN1/UART_RXD2	I/O	LINK0 口 RX-/UART2
12	RXIP2/SD_D7/GPIO18	I/O	LINK1 口 RX+/SD data7
13	RXIN2/SD_D6/GPIO19	I/O	LINK1 口 RX-/SD data6
14	TXOP2/SD_D5/GPIO20	I/O	LINK1 口 TX+/SD data5
15	TXON2/SD_D4/GPIO21	I/O	LINK1 口 TX-/SD data4
16	TXOP3SD_WP	I	LINK2 口 TX+/SD write protection
17	TXON3/SD_CD	I	LINK2 口 TX-/SD Detection
18	RXIP3/SD_D1	I/O	LINK2 口 RX+/SD data1
19	RXIN3/SD_D0	I/O	LINK2 口 RX-/SD data0
20	RXIP4/SD_CLK	0	LINK3 口 RX+/SD clock
21	RXIN4/SD_CMD	I/O	LINK3 口 RX-/SD command
22	TXOP4/SD_D3	I/O	LINK3 口 TX+/SD data3
23	TXON4/SD_D2	I/O	LINK3 口 TX-/SD data2
24	GND	Power	Power Ground

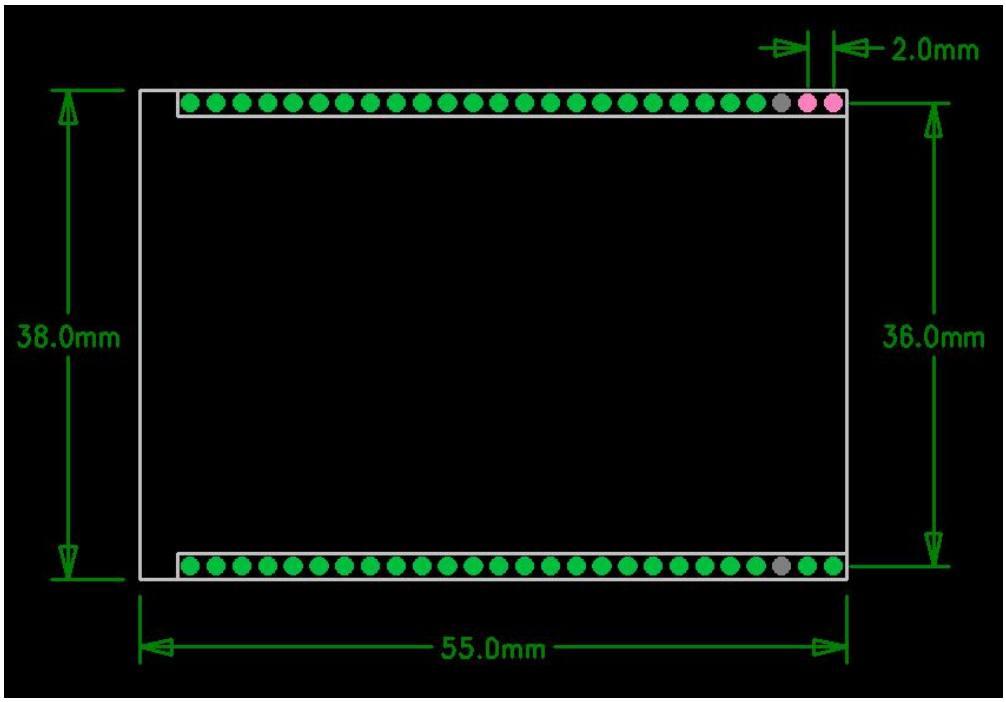
25	USB_DP	I/O	USB2.0 D+
26	USB_DM	I/O	USB2.0 D-
27	DC3V3	Power	Power (Need ripple small, current is big) use DC-DC chip
28	DC3V3	Power	Power (Need ripple small, current is big) use DC-DC chip
29	GND	Power	Power Ground
30	*PERST_N	I/O	PCIe device reset
31	REF_CLKO	I/O	CLKOUT
32	WPS_RST_BUTTON	I/O	WatchDog reset
33	CPURST_N	I/O	System reset
34	GPIO39	I/O	The default is LINK3 status indication.
35	GPIO40	I/O	The default is LINK2 status indication.
36	GPIO41	I/O	The default is LINK1 status indication.
37	GPIO42	I/O	The default is LINK0 status indication.
38	GPIO43	I/O	The default is WAN status indication.
39	WLED_N	O	WIFI status indicator
40	*UART_TX1	O	UART1 send 3.3V cmos level
41	UART_RX1	I	UART1 receive 3.3V cmos level
42	I2S_SDI	I	I2S data input

43	*I2S_SDO	O	I2S data output
44	I2S_WS	O	I2S Audio interface ADC left / right clock
45	I2S_CLK	O	I2S Bit Clock
46	I2C_SCLK	O	I2C Clock
47	I2C_SD	I/O	I2C Data
48	*SPI_CS1	I	
49	SPI_MISO	I	
50	SPI_CS0	O	SPI Chip Selection(default selection)
51	*SPI_CLK	O	
52	*SPI_MOSI	O	

The red signal with the prefix "red" is used for the system startup configuration, and the external non-driver is not pulled down, which will cause the startup to fail.

For more details on multiplexing, check out the Datasheet.

2.2 Package Dimensions



The pin spacing is 2.0mm. When the client designs PCB, clients can contact our company to provide packaging, which can provide the schematic diagram of AD, PADS, Orcad, Allergo and PCB packaging.

2.3 Development Kit

The Elementary Charge Communication Technology provides dyq-mt76x8 , ydh-mt76x8 kit and lds-mt76x8 evaluation and development kit for customers to quickly become familiar with the products and develop in-depth application.

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

Note 1: 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.

Note 2: 1.Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

2. The minimum separation generally be used is at least 20 cm.