Product model: Z8102AX-M2-S

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产品规格书

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Table of contents

1 Review

1.1 Brief overview

This document describes the electrical characteristics, RF performance, dimensions and application environment of the Z8102AX-M2-S. With the introduction of this document, end users or developers can quickly understand the hardware functions of Z8102AX-M2-S.

Z8102AX-M2-S is a 5G/4G+WIFI6 home CPE router, which can access the Internet through 5G/4G mobile communication dial-up or 1000Mbps WAN port, and then share the Internet network through wireless WiFi 6 and 1000Mbps wired LAN.

1.2 Reference standards

Related standard specifications:

- USB3.0/USB2.0 bus standard

- PCI- Express bus standard

- SIM/USIM interface standard

- IEEE802.11n/g/b/a/ac/ax

- IEEE802.3/802.3u/802.ab

- PCI Express M.2 Specification Rev1.1

- 5G/4G mobile communication standard, specifically determined by the selected 5G/4G mobile communication module

2 Product photo
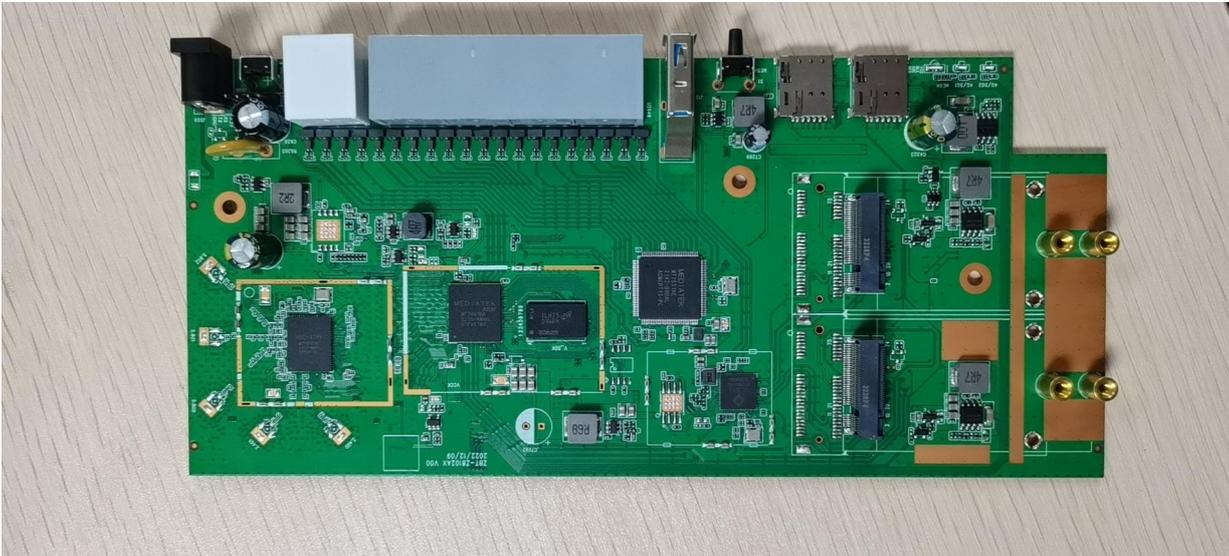
3 Product main features

- Using MT7981B solution, ARM Cortex-A53 dual-core CPU, main frequency up to 1.3GHZ;

- Adopt independent WIFI6 chip, MT7976CN, the speed is up to 3000Mbps;

- High-speed 1GB DDR4, with 128MB SPI NAND Flash;

- 1WAN+4LAN 1000M adaptive network port, support automatic flip (Auto MDI/MDIX);

- Support "one-key flashing mode", that is, long press the reset button to enter the rescue flashing mode;

- Support "one key " MESH network;

- Built-in 2 M.2/Mini-PCIE standard interfaces (choose one of the two), which can be used to connect to 5G/4G mobile communication modules;

- External standard Nano SIM card (small card) interface and built-in eSIM (QFN-8 6mmx5mm) card interface, support SIM/USIM card;

- External high-gain WIFI antenna, 360-degree wireless signal without dead angle;

4 Hardware function

4.1 Hardware Interface Introduction

Network ports		1*WAN port, 1000Mbps supports automatic flip (Auto MDI/MDIX) Conforms to IEEE 802.3/802.3u/802.ab
		4* LAN port, 1000Mbps supports automatic flip (Auto MDI/MDIX) Conforms to IEEE 802.3/802.3u/802.ab
Power interface		DC5.5*2.1MM
Button		1 Reset button,1*USB3.0 port,1* MESH button.
4G/5G interface		2 *M.2 Ports
Un-remo vable Antennas	5G dual module	2* external omnidirectional 5dbi 5G mobile communication & 2.4G Wifi dual frequency dual outlet antennas
		2* external omnidirectional 5dbi 5G mobile communication & 5.8G WIFI dual frequency dual outlet antennas

		4* external omnidirectional 5dbi 5G mobile communication single outlet antennas
		1* internal omnidirectional 5dbi 5.8G WIFI FPC antenna

4.2 Indicator light function introduction

MESH LED	1. During the device startup, the red light will turn on. After the startup, the red light will turn off and the green light will turn on 2. Press the mesh button to enter the mesh pairing, the green light flashes once a second, while the other lights do not light up 3. The main device network is normal, both green and blue lights on (cyan) 4. Slave device MESH successfully , with both green and red lights on (orange) at a long distance, and both green and blue lights on (cyan) at a good distance
5G1 LED	Light is always on when access the network , and flashes when there is data communication
5G2 LED	Light is always on when access the network , and flashes when there is data communication

4.3 Hardware Platform Introduction

Processor	MT7981B ARM Cortex-A53 dual-core CPU, 1.3GHZ main frequency
WIFI Chip	MT7976CN IEEE 802.11n/g/b/a/ac/ax,Max. 3000Mbps
RAM	DDR4 1GB
Flash	Nor Flash 16MB(Optional)
	SPI NAND Flash 128MB
	EMMC 8GB (Optional)

4.4 Hardware watchdog function introduction

This hardware product is designed with a hardware watchdog function. After the hardware watchdog is powered on, it will automatically start up and detect the heartbeat level output by the routing system that jumps once every second. If the routing system itself fails (such as a crash), it will also Naturally, the heartbeat level can no longer be output. At this time, if the hardware watchdog has not detected the heartbeat level within 120 seconds, it will shut down by itself for 15 seconds and then restart the entire system.

When the routing system is running normally, but the 5G/4G module dialing is abnormal, the routing system will control the power supply of the 5G/4G module through GPIO, so that the module will automatically restart to fix the 5G/4G dialing abnormality.

Specific function of hardware watchdog	
Routing system crash	Module dialing crash
Restart the whole system	Only restart the module

5 Power Supply And Power Consumption Description

	Test Conditions	Min	Rated Value	Max	Unit
Operating Voltage	T A = 25°C	9	12	35	V
Absolute working voltage	T A = 25°C	8.5		36	V
Working current	VIN=12V，T A = 25°C	0.6	1,2	2.5	A

Please use the ZBT standard power adapter to power this product. If you do not use the ZBT standard power supply, please strictly follow the above power specification parameters to power this product, otherwise the product will be damaged. If you use batteries or vehicle power supplies, please take anti-static and anti-surge measures.

6 WIFI Wireless Parameter Introduction

6.1 WIFI EVM Index

	Mode Description	Index parameter	Unit
EVM index	802.11B 11Mbps	≤ -1 5 dB	dBm
	802.11G 54 Mbps	≤ -25 dB	dBm
	802.11N HT20@ MCS7	≤ -28 dB	dBm
	802.11N HT40@ MCS7	≤ -28 dB	dBm
	802.11AC VHT20@ MCS8	≤ -30 dB	dBm
	802.11AC VHT40@ MCS9	≤ -32 dB	dBm
	802.11AC VHT80@ MCS9	≤ -32 dB	dBm
	802.11AX HE20@MCS 11	≤ -35 dB	dBm
	802.11AX HE40@MCS 11	≤ -35 dB	dBm
	802.11AX HE80@MCS 11	≤ -35dB	dBm

6.2 WiFi 2.4G

Compatible with IEEE 802.11 b/g/n/ac/ax, supports 20MHz or 40MHz, modulation method 1024-QAM / OFDMA, adopts 2T2R MU-MIMO antenna technology, and the maximum connection rate is up to 574Mbps. The following is a description of the power frequency, receiving sensitivity, and transmitting power of 2.4G WIFI.

	illustrate	Max	Rated Value	Min	Unit
Working frequency		2484		2412	MHz
Receiver sensitivity	802.11B 11Mbps	-86	-87	-88	dBm
	802.11G 54 Mbps	-71	-73	-75	dBm
	802.11N HT20@ MCS7	-68	-70	-72	dBm
	802.11N HT40@ MCS7	-66	-68	-70	dBm
	802.11AC VHT20@ MCS8	-64	-66	-68	dBm
	802.11AC VHT40@ MCS9	-62	-64	-66	dBm

	802.11AX HE20@MCS11	-60	-62	-64	dBm
	802.11AX HE40@MCS11	-58	-60	-62	dBm
transmit power	802.11B 11Mbps	22	21	20	dBm
	802.11G 54 Mbps	20	19	18	dBm
	802.11N HT20@ MCS7	19	18	17	dBm
	802.11N HT40@ MCS7	19	18	17	dBm
	802.11AC VHT20@ MCS8	18	17	16	dBm
	802.11AC VHT40@ MCS9	18	17	16	dBm
	802.11AX HE20@MCS11	17	16	15	dBm
	802.11AX HE40@MCS11	17	16	15	dBm

6.3 WiFi 5.8G

Compatible with IEEE 802.11 a/an/ac/ax, supports 20MHz, 40MHz, 80MHz, 160MHz, modulation method 1024-QAM / OFDMA, adopts 2T3R MU-MIMO antenna technology, and the maximum connection rate is up to 2400Mbps. The following is a description of the power frequency, receiving sensitivity, and transmitting power of 5.8G WIFI.

	illustrate	Max	Rated Value	Min	Unit
Working frequency		5825		5180	MHz
Receiver sensitivity	802.11G 54 Mbps	-70	-72	-74	dBm
	802.11N HT20@ MCS7	-68	-70	-72	dBm
	802.11N HT40@ MCS7	-66	-68	-70	dBm
	802.11AC VHT20@ MCS8	-64	-66	-68	dBm
	802.11AC VHT40@ MCS9	-62	-64	-66	dBm
	802.11AC VHT80@ MCS9	-60	-62	-64	dBm
	802.11AX HE20@MCS 11	-58	-60	-62	dBm
	802.11AX HE40@MCS 11	-55	-57	-59	dBm
	802.11AX HE80@MCS 11	-53	-55	-57	dBm

transmit power	802.11G 54 Mbps	20	19	18	dBm
	802.11N HT20@ MCS7	19	18	17	dBm
	802.11N HT40@ MCS7	18	17	16	dBm
	802.11AC VHT20@ MCS8	18	17	16	dBm
	802.11AC VHT40@ MCS9	17	16	15	dBm
	802.11AC VHT80@ MCS9	16	15	14	dBm
	802.11AX HE20@MCS 11	18	17	16	dBm
	802.11AX HE40@MCS 11	17	16	15	dBm
	802.11AX HE80@MCS 11	16	15	14	dBm

7.Structural Parameters And Accessories Introduction

Weight（KG）	TBD	
Enclouse size	L*W*H=245*160*42mm	
Color	Black	
Accessories	Power adapter	12V/2.5A 1pc
	Manual	1pc
	Certificate	1pc
	Cable	8P8C Network cable 1pc

8 Product Working Environment Requirements

Operating temperature	0℃ to 40℃
storage temperature	-40℃to 70℃
Working humidity	10% to 90%RH non-condensing
storage humidity	5% to 90%RH non-condensing

9 Software Configuration Information

Default IP	192.168.1.1
Username Password	root/admin

2.4G SSID	WIFI-XXXXXX (X is the last 6 digits of the MAC address), no password by default
5.8G SSID	WIFI-5G-XXXXXX (X is the last 6 digits of the MAC address), no password by default

Above is the general default configuration information of the product. The WIFI SSID of our OS firmware or OPENWRT firmware may be different, but the default IP, WEB login name and password of this product remain unchanged. For other detailed software functions, please refer to the product description.