Product model:

Z8102A

Issue: V1.0

User manual

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Contents

1 Overview

1.1 Brief Overview

This document describes the electrical characteristics, RF performance, dimensions, and application environment of the Z8102A. In this document description, end users or developers can quickly understand the hardware features of the Z8102A.

The Z8102AX is a 4G+WIFI6 home CPE route that accesses the Internet via 4G mobile dial-up or 1000Mbps WAN port, and then shares the Internet network via wireless WiFi 6 and 1000Mbps wired LAN.

1.2 Reference Standards

Relevant standard specifications:

- USB3.0/USB2.0 bus standards
- SIM/USIM interface standard
- IEEE802.11 n/g/b/a/ac/ax
- The IEEE802.3/802.3 u / 802. Ab
- PCI Express Specification Rev1.1

2 Main features of the product

- Adopt MT7981B scheme, ARM Cortext-A53 dual-core CPU, the main frequency up to 1.3GHZ
- Independent WIFI6 chip, MT7976CN, speed up to 3000Mbps
- It uses high-speed 1GB DDR4 with 128MB SPI NAND Flash
- 1WAN+4LAN 1000M adaptive network port supports Auto MDI/MDIX...
- Support "one-key brush mode", that is, long press the reset button to enter the rescue brush mode...
- Support "one-key" MESH networking...
- 2 built-in PCIE standard interfaces, which can be used to connect to 4G mobile communication modules
- External standard Nano SIM card (small card) interface and built-in eSIM(QFN-8 6mmx5mm) card interface, supporting SIM/USIM card
- External high-gain WIFI antenna, wireless signal 360 degrees without dead Angle

3 Hardware Features

3.1 Hardware Ports

Net interface	1 WAN port with 1000Mbps support for Auto flip (Auto MDI/MDIX) Compliant with IEEE 802.3/802.3u/802.ab
	4 LAN ports, 1000Mbps support automatic flipping (Auto MDI/MDIX) Comply with IEEE 802.3/802.3u/802.ab
Power Interface	DC5.5*2.1MM port
Keys	1 reset button, 1 MESH button
4G port	PCIE ports 2

3.2 Indicator function Description

MESH LED	2. Press the mesh button to enter the mesh pairing state. The green light flashes once a second, while other lights are off . 3. The main device network is normal, the green and blue lights are on at the same time (cyan) 4. The secondary device MESH connection is successful, the distance is far away, the green and red lights are on at the same time (orange), the distance is suitable for the green and blue lights are on at the same time (cyan)
4G1 LED	4G network is steady on and blinks when there is data communication
4G2 LED	4G network is steady on and blinks when there is data communication

3.3 Hardware Platform Introduction

Processor	MT7981B ARM Cotext-A53 dual-core CPU, 1.3GHZ main frequency
WIFI chip	MT7976CN IEEE 802.11n/g/b/a/ac/ax with a maximum speed of 3,000 MBPS
Memory	DDR4 1GB
Flash memory	Nor Flash 16MB(optional)
	SPI NAND Flash 128MB
	EMMC 8GB(optional)

3.4 Hardware Watchdog Function Description

This hardware product is designed with the hardware watchdog function. After power-on, the hardware watchdog will automatically turn on and detect the heartbeat level that changes once a second output by the routing system. If the routing system itself fails (such as crash), it will naturally no longer output the heartbeat level. It will shut down itself for 15 seconds and then restart the whole system.

When the routing system runs normally but the 5G module dials abnormally, the routing system will control the power supply of the 5G module through GPIO, and the module will automatically restart to fix the abnormal 5G dials.

Specific functions of hardware watchdog	
Routing system exception	Module dialing exception
Restart the entire system	Restart only modules

4 4G mobile communication function

This product has 2 built-in PCIE interfaces, which can be used to expand the dual-module 4G mobile communication function, and the built-in PCIE interface supports the USB3.0 bus. 4G mobile communication specific support NSA or SA, the specific support of what frequency band is determined by the selection of 4G module. For specific 4G functions, please communicate with Zhibotong customer service, and refer to the 4G module specification to determine

4.1.3 Features

- ✓ DFOTA
- ✓ (U)SIM Card detection (optional)

Supply voltage: 3.3~4.3V, typical 3.8V
Operating temperature: -20~+60℃
Operator certification: Mobile storage/Unicom storage/Telecom storage
Compulsory certification: CCC/SRRC/NAL(China)
Other certifications: RoHS

4.2.3 Other features

- ✓ (U)SIM Card Detection (optional)

Supply voltage: 3.4~4.5V, typical 3.8V
Operating temperature: -35~+75℃

5 Power supply and power consumption description

	Test Conditions	Minimum value	Rating	Maximum value	Units
Operating voltage	T A = 25 ℃	9	12	35	V
Absolute operating	T A = 25 ℃	8.5		36	V
Working current	VIN=12V, TA = 25 ℃	0.6	1.2	2.5	A

Please use the ZBT standard power adapter to power the product. If you do not use the ZBT standard power supply, please strictly follow the above power specifications to power the product, otherwise the product will be damaged. If you use battery or vehicle power supply, please be sure to do a good job of anti-static, anti-surge countermeasures.

6 WIFI wireless parameters

6.1 WIFI EVM Specifications

	Mode Description	Indicator parameters	Units
EVM Indicators	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 802.11b /g/n/ac/ax; Support 20MHz, 40MHz, modulation mode 1024-QAM/OFDMA, using 2T2R MU-MIMO antenna technology, the highest connection rate up to 574Mbps. The following is a description of the power frequency, receiving sensitivity and transmitting power of 2.4G WIFI.

	Instructions	Maximum	Rating	Minimum value	Units
Receiving 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

6.3 WIFI

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

7 Structural parameters and accessories

Weight (KG)	TBD	
Shell size	L * W * H = 249.97 * 159.97 * 42 mm	
Color scheme	black	
attachment	Power adapter	12V/2.5A 1PCS
	Instruction Manual	1PCS
	Certificate of conformity	1PCS
	Network cable	8P8C network cable 1PCS

8 Requirements for the working environment of the product

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

9 Software formulation information

Default IP	192.168.1.1
Username/password	root/admin
2.4G SSID	WIFI6-XXXXXX (X is the last 6 digits of the MAC address), no password by default
5.8G SSID	WIFI6-5G-XXXXXX (X is the last 6 digits of the MAC address), no password by default

The 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 and WEB login name and password of this product will remain unchanged. For other software functions, please refer to the product description.

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.

10 FCC warning:

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.

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 & your body.

11 IC warning

- English:

This device complies with Industry Canada licence-exempt RSS standard(s).

Operation is subject to the following two conditions: (1) This device may not cause interference, and (2) This device must accept any interference, including interference that may cause undesired operation of the device.

- French:

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1) L'appareil ne doit pas produire de brouillage;

2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20cm de distance entre la source de rayonnement et votre corps.

The distance between user and products should be no less than 20cm. Operations in the 5.15-5.25 GHz band are restricted to indoor usage only.

La distance entre l'utilisateur et les produits ne doit pas être inférieure à 20 cm

Operations in the 5.15-5.25GHz band are restricted to indoor usage only

Les opérations dans la bande 5,15-5,25 GHz sont limitées à une utilisation en intérieur uniquement