SPECIFICATION

Model :Z8105AX-M2-H

Wifi6 Gigabit Dualband 4G/5G Router

1. Overview

1.1 Brief overview

This document describes the electrical characteristics, RF performance, dimensions and application environment of the Z8105AX-M2-H. With the introduction of this document description, end users or developers can quickly understand the hardware capabilities of the Z8105AX-M2-T.

Z8105AX-M2-H 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. In addition, this product also uses a PHY network interface chip to directly communicate with the 5G module, improving the speed and making its high-speed transmission or reception ability more stable.

It can be OEM 2.5Gbps WAN port.

1.2 Reference standards

Related standard specifications:

1).USB3.0/USB2.0 bus standard

2).SIM/USIM interface standard

3).IEEE802.11n/g/b/a/ac/ax

4).IEEE802.3/802.3u/802.ab

5).PCI Express M.2 Specification Rev1.1

6).3GPP R16 5G mobile communication standard

2. Product Pictures

Packing

3. Product main features

1). Using in MT7981B solution, ARM Cortext-A53 dual-core CPU, main frequency up to 1.3GHZ

2). Adopt independent WIFI6 chip, MT7976CN, the speed is up to 3000Mbps.Support 128 WIFI wireless terminals online simultaneously

3). High-speed 256M DDR3, with 128MB SPI NAND Flash

4).1WAN+3LAN,All support 10/100/1000M adaptive, support automatic flip (Auto MDI/MDIX)

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

6).Support "one-key" MESH networking

7).Built in 1 M.2 standard interface, which can be used to connect to 5G mobile communication modules

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

9).Built-in high gain WIFI antenna and 5G mobile communication antenna, wireless signal 360 degrees without dead angles.
10). It can be OEM support 2.5G

4 Hardware function

RJ45 ports	1*WAN port, 1000Mbps supports automatic flip (Auto MDI/MDIX) Conforms to IEEE 802.3/802.3u/802.ab. It can be support OEM 2.5Gbps WAN port.

	3* LAN port, 1000Mbps supports automatic flip (Auto MDI/MDIX) Conforms to IEEE 802.3/802.3u/802.ab
SIM interface	1* Standard SIM interface, supporting SIM/USIM
Power interface	DC5.5*2.1MM
Button	1* reset button, 1* MESH button
Antennas	Built in 2* omnidirectional 8dbi 2.4G and 4G/5G external antennas
	Built in 2* omnidirectional 8dbi 5.8G and 4G/5G external antennas
	Built in 1* omnidirectional 8dbi 5.8G internal antenna

4.2 Indicator light function introduction

POWR LED	Power indicator light, normally on when power supply is normal, but not on when power supply is abnormal
MESH LED	1. During the startup process, the red light will turn on. After the startup is completed, the red light will turn off and the green light will turn on 2. Press the mesh button to enter the mesh pairing state. The green light flashes once a second, while the other lights do not light up 3. The main device network is normal, with both green and blue lights on (cyan) Successfully connected from the device MESH, with both green and red lights on (orange) at a distance, and suitable for both green and blue lights on (cyan) at a distance
5G LED	5G network connection is always on, flashing when there is data communication
WAN LED	Normally lit when connected to the internet port, flashing when there is data communication
LAN1 LED	Normally lit when connected to the internet port, flashing when there is data communication
LAN2 LED	Normally lit when connected to the internet port, flashing when there is data communication
LAN3 LED	Normally lit when connected to the internet port, flashing when there is data communication
SYS LED	System status light, system running normally on, abnormal not on

4.3 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,Max. 3000Mbps
RAM	DDR3 256MB
Flash	SPI NAND Flash 128MB

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 automatically shut down for 15 seconds before restarting 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 exception	Module dialing exception
restart the whole system	Only restart the module

5. 5G mobile communication function

This product supports Sub-6GHz module, 5G communication module, 5G independent networking (SA) and non independent networking (NSA) network

architectures, supports the frequency band requirements of all domestic operators, and Backward compatibility 4G/3G networks. At the same time, it can expand and hold multiple sets of 5G network slices, air port precision time service, 5G LAN and other R16 new technologies, which can be widely used in FWA, Internet, power, networking, high-definition video, telemedicine Vertical industries such as smart cities.

5.1 Support global frequency bands (3G&4G&5G) .We can introduce different 4G or 5G module as per customer requirement in different countries.

5G NR:	n1/ 2/ 3/ 5/ 7/ 8/ 12/ 13/ 14/ 18/ 20/ 25/ 26/ 28/ 29/ 30/ 38/ 40/ 41/ 48/ 66/ 70/ 71/ 75/ 76/ 77/ 78/N79
5G NR SA：	n1/ 2/ 3/ 5/ 7/ 8/ 12/ 13/ 14/ 18/ 20/ 25/ 26/ 28/ 29/ 30/ 38/ 40/ 41/ 48/ 66/ 70/ 71/ 75/ 76/ 77/ 78/ n79
LTE FDD:	B1/ 2/ 3/ 4/ 5/ 7/ 8/ 12/ 13/ 14/ 17/ 18/ 19/ 20/ 25/ 26/ 28/ 29/ 30/ 32/ 66/ 71
LTE TDD:	B34/ 38/ 39/ 40/ 41/ 42/ 43/ 48
LAA	B46
WCDMA:	B1/ 2/ 4/ 5/ 8/ 19

5.2 Theoretical rate of 5G communication

Data Rates(Max)	5G NR Sub-6GHz	LTE	WCDMA
Downlink	2Gbps	400Mbps	42.4Mbps
Uplink	900Mbps	150Mbps	5.76Mbps

6. Power supply instructions

6.1 Working voltage and current

	Test conditions	Minimum Value	Rated Value	Maximum Value	unit
working voltage	T A = 25°C	9	12	24	V
Absolute working voltage	T A = 25°C	8		30	V
Working current	VIN=12V，T A = 25°C	0.3	1	1.6	A
Maximum power consumption	5G communication and WIFI high load	/	/	19.2	W
Conventional power consumption	5G communication and internet surfing	/	12	/	W

6.2 Power adapter parameters

	Specification parameters
	Specification parameters
Power input	AC 100-240V 50-60Hz
Power Output	12V-2A
connector	Configure according to requirements

Please use the standard power adapter to power this product. If the standard power adapter is not used for power supply, please strictly follow the above power specification parameters to power this product, otherwise it may damage the product. If using batteries or on-board power supply, please make sure to take anti-static and anti-surge measures.

7. WIFI Introduction of wireless parameters

7.1 WIFI EVM metrics

	Mode Description	Indicator parameters	unit
EVM metrics	802.11B 11Mbps	≤ -15 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

7.2 WIFI 2.4G

Compatible with IEEE 802.11 b/g/n/ac/ax, supporting 20MHz, 40MHz, modulation method 1024-QAM/OFDMA, using 2T2R MU-MIMO antenna technology, with a maximum connection rate of 573.5Mbps. The following is an explanation of the power frequency, reception sensitivity, and transmission power of 2.4G WIFI.

	Illustration	Maximum Value	Rated Value	Minimum Value	unit
Working Frequency		2484		2412	MHz

Receiving sensitivity	802.11B 11Mbps	-86	-87	-88	dBm
	802.11G 54 Mbps	-69	-71	-73	dBm
	802.11N HT20@ MCS7	-67	-69	-71	dBm
	802.11N HT40@ MCS7	-65	-67	-69	dBm
	802.11AC VHT20@ MCS8	-63	-65	-67	dBm
	802.11AC VHT40@ MCS9	-61	-63	-65	dBm
	802.11AX HE20@MCS11	-62	-64	-66	dBm
	802.11AX HE40@MCS11	-60	-62	-64	dBm
Transmitting 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

7.3 WIFI 5.8G

Compatible with IEEE 802.11 a/ac/ax, with modulation modes of

1024-QAM/OFDMA at 20MHz, 40MHz, 80MHz, and 160MHz, using 3T3R

MU-MIMO antenna technology, with a maximum connection rate of up to 2400Mbps.

The following is an explanation of the power frequency, reception sensitivity, and

transmission power of 5.8G WIFI.

	illustration	Maximum Value	Rated Value	Minimum Value	unit
Working Frequency		5825		5180	MHz
Receiving sensitivity Transmitting power	802.11G 54 Mbps	-69	-71	-73	dBm
	802.11N HT20@ MCS7	-67	-69	-71	dBm
	802.11N HT40@ MCS7	-65	-67	-69	dBm
	802.11AC VHT20@ MCS8	-63	-65	-67	dBm
	802.11AC VHT40@ MCS9	-61	-63	-65	dBm
	802.11AC VHT80@ MCS9	-59	-61	-63	dBm
	802.11AX HE20@MCS 11	-57	-59	-61	dBm
	802.11AX HE40@MCS 11	-55	-57	-59	dBm
	802.11AX HE80@MCS 11	-53	-55	-57	dBm
Transmitting 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

8 Introduction to structural parameters and accessories

weight（KG）	4.0KG
Size	L*W*H=300*375*345mm
Color	Gray

Accessori es	Power adapter	48V/0.5A 1PCS
	User Manual	1PCS
	certificate	1PCS
	Ethernet cable	8P8C Cat5 cable 1PCS

9 .Product working environment requirements

Working temperature	-20℃ - 60℃
Store temperature	-45℃ - 90℃
Working humidity	10% - 90%RH Non condensing
Store humidity	5% - 90%RH Non condensing

10 Software configuration information

Default IP	192.168.1.1	
Username/p assword	root/admin	
2.4G SSID	WIFI6-XXXXXX (X is the last 6 bits of MAC address), default no password	
5.8G SSID	WIFI6-5G-XXXXXX (X is the last 6 bits of MAC address), default no password	
Language	China, Britain, France, Germany, Russia, South Korea	
Https/Http	support	
Network Settings	Terminal Management	
	NAT acceleration	
	QoS speed limit	
	4G/5G settings	4G/5G internet priority setting
	WAN port settings	Automatic
		Fixed IP
		PPPoE
	Wi-Fi settings	SSID settings
		Channel settings
		Encryption method and password settings
		Working bandwidth

		Working mode
	LAN Settings	LAN network IP
		DHCP settings
		Static routing settings
system state	5G/4G status information	SIM card status
		4G/5G network status
		4G/5G signal strength
		4G/5G traffic statistics
	APN/DHCP/Wi-Fi information	
	Memory Details	
	Version/Device Information	
advanced setting	Security settings (firewall, network redirection)	
	DMZ host	
	Dynamic DDNS	
	ACL specifications	
	Blacklist	
Service and application	Cloud login	
	Cloud Management	
	PPTP VPN	
	L2TP VPN	
	Port forwarding	
System settings	System updates	
	Backup and reset	
	NTP time synchronization	
	log information	
	Automatic restart	
System Tools	Network diagnosis	
	Base station inspection	

The above is the general default configuration information for the product. Using our OS firmware or OPENWRT firmware WIFI SSID may vary, but the default IP and WEB login name and password for this product remain unchanged. Please refer to the product manual for other detailed software functions.