Model No.: Z6001AX-M2-H

Version:V1.1

产品规格书

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1 Overview

1.1 Brief Introduction

This document describes the electrical characteristics, RF performance, size and application environment of Z6001AX-M2-H. With the introduction of this document, end users or developers can quickly understand the hardware functions of Z6001AX-M2-H.

Z6001AX-M2-H is a 5g + WiFi 6 outdoor CPE product. It accesses the Internet through 5G and Gigabit WAN port dial-up, and then shares the Internet network through wireless WiFi 6 and Gigabit wired LAN.

1.2 Reference standard

Relevant standards and specifications:

- USB3.0 / USB2.0 bus standard
- PCI Express bus standardPCI- Express
- 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 mobile communication standard

2 Picture

3 Main Features

- Adopt IPQ6000 scheme, with Quad-Core ARM Cortex A53s CPU,main frequency up to 1.2 GHz
- Independent WiFi chip is adopted, with QCN5022 for 2.4Ghz and QCN5052 for 5.8Ghz
- 2.4Ghz rate up to 573.5mbps, 5.8Ghz rate up to 1201mbps, collectively referred to as 1800 Mbps
- Support MU-MIMO, and WiFi modulation mode supports 1024-QAM and OFDMA
- Each WiFi channel is independently equipped with high-power FEM, which is combined with high gain antenna to achieve super WiFi coverage
- High speed 256MB DDR3 with 128MB NAND flash storage
- One gigabit external self-adaption LAN port ,support automatic flip (auto

MDI / MDIX)

- External LAN port support standard POE-PD function,comply with IEEE802.3af/at standard
- One built-in M.2 interface for connect 5G communication module, and the module power supply is independently controlled through GPIO
- Internal standard SIM card interface, supporting SIM / USIM card
- IPQ6000 has its own watchdog function, which automatically restarts in case of crash
- When multiple products are used at the same time, MESH automatic networking is supported
- With fully sealed metal shell to achieve heat dissipation and waterproof functions, meeting IP67 standards

4 Hardware

4.1 Hardware interface

Ethernet Port	1*LAN, 1000Mbps (Support Auto MDI/MDIX), IEEE 802.3/ 802.3u/ 802.ab
Power port	Non standard POE power supply (Can customize for standard POE)
Buttons	1*Reset and 1*MESH
SIM card slot	1*Standard SIM card Slot, Support SIM/USIM
Antennas	2* 2.4G+5G fiberglass antennas
	2* 5.8G+5G fiberglass antennas
M.2 interface	Built-in M.2*1, Support USB3.0 and PCIE Bus, support 5G module

4.2 Hardware Platform Introduction

Main Chip	IPQ6000 Quad-core ARM Cortex A53s CPU, 1.2GHZ main frequency

2.4G WIFI chip	QCN5022 IEEE 802.11ax/n/g/b,up to 573.5Mbps, 2T2R
5.8G WIFI chip	QCN5052 IEEE 802.11ax/ac/a,up to 1201Mbps, 2T2R
RAM	DDR3 256MB (One DDR matches 32bit firmware)
Flash	128MB NAND FLASH

4.3 Indicator Function Introduction

Power LED	It is always on when power supply is connected, but not on when power supply is faulty or not connected
SYS LED	1.Red color when startup,green color or off after boot 2.Press Mesh button,ready for Mesh pairing, green light flash per seconds,other indicators not work 3.The network of the main device is normal,Green and blue lights go on at the same time(cyan color) 4.The slave device MESH is connected successfully, when it's little far away,green and red lights go on(orange),green and blue lights go on when proper distance(cyan)
5G LED	The light is always on when the routing system identifies and successfully mounts the mobile communication module, and is not on when the mobile communication module is faulty or not connected to the 5G mobile communication module
WAN LED	When connected to the network, it is always on and blinks when there is data communication, the port has LED
LAN1 LED	When connected to the network, it is always on and blinks when there is data communication, the port has LED
LAN2 LED	When connected to the network, it is always on and blinks when there is data communication, the port has LED
LAN3 LED	When connected to the network, it is always on and blinks when there is data communication, the port has LED

All the above indicator lights are built into the housing

4.4 Watchdog function

When the routing system runs normally, but the 5g module dialing is abnormal, the routing system will control the power supply of the 5g module through GPIO to restart the 5g module automatically to repair the 5g dialing abnormality

When the system moves abnormally, the watchdog function of ipq6000 will restart the whole system.

4.5 5G Module interface description5G

This product built-in M.2 interface, which can be used to expand 5G mobile communication function. M.2 interface supports USB3.0 and PCIe bus. Whether 5g mobile communication supports NSA or SA and frequency bands is determined by the selected 5G module.

5 Introduction of wireless parameters

5.1 WIFI EVM index

	Mode description	Index parameters	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

5.2 WIFI 2.4G

Compatible with IEEE 802.11 B / g / N / AC / ax, support 20MHz or 40MHz, modulation mode 1024-qam / OFDMA, adopt 2T2R MU-MIMO antenna technology, and the maximum connection rate is up to 573.5mbps. The following is the description of working frequency, receiving sensitivity and transmitting power of 2.4G WiFi.

	Description	Maximum Value	Rating value	Minimum value	Unit
Working Frequency		2484		2412	MHz
Receiving Sensitivity	802.11B 11Mbps	-86	-87	-88	dBm
	802.11G 54 Mbps	-72	-74	-76	dBm
	802.11N HT20@ MCS7	-70	-72	-74	dBm
	802.11N HT40@ MCS7	-70	-72	-74	dBm
	802.11AC VHT20@ MCS8	-68	-70	-72	dBm
	802.11AC VHT40@ MCS9	-66	-68	-70	dBm
	802.11AX HE20@MCS11	-66	-68	-70	dBm
	802.11AX HE40@MCS11	-64	-65	-76	dBm
Transmitting Power	802.11B 11Mbps	26	25	24	dBm
	802.11G 54 Mbps	24	23	22	dBm
	802.11N HT20@ MCS7	23	22	21	dBm
	802.11N HT40@ MCS7	22	21	20	dBm
	802.11AC VHT20@ MCS8	22	21	20	dBm
	802.11AC VHT40@ MCS9	21	20	19	dBm
	802.11AX HE20@MCS11	21	20	19	dBm
	802.11AX HE40@MCS11	20	19	18	dBm

5.3 WIFI 5.8G

Compatible with IEEE 802.11 A / AN / AC / AX, supports 20MHz, 40MHz, 80MHz, modulation mode 1024-QAM / OFDMA, adopts 2T2R MU-MIMO antenna technology, and the maximum connection rate is up to 1201mbps. The following is the description of working frequency, receiving sensitivity and transmitting power of 5.8G WiFi.

	Description	Maximum Value	Rating Value	Minimum Value	Unit
Working Frequency		5825		5180	MHz
Receiving Sensitivity	802.11G 54 Mbps	-72	-73	-74	dBm
	802.11N HT20@ MCS7	-70	-72	-74	dBm
	802.11N HT40@ MCS7	-70	-72	-74	dBm
	802.11AC VHT20@ MCS8	-68	-70	-72	dBm
	802.11AC VHT40@ MCS9	-66	-68	-70	dBm
	802.11AC VHT80@ MCS9	-62	-64	-66	dBm
	802.11AX HE20@MCS 11	-66	-68	-70	dBm
	802.11AX HE40@MCS 11	-62	-64	-66	dBm
	802.11AX HE80@MCS 11	-60	-62	-64	dBm
Transmitting power	802.11G 54 Mbps	24	23	22	dBm
	802.11N HT20@ MCS7	23	22	21	dBm
	802.11N HT40@ MCS7	22	21	20	dBm
	802.11AC VHT20@ MCS8	21	20	19	dBm
	802.11AC VHT40@ MCS9	20	19	18	dBm
	802.11AC VHT80@ MCS9	19	18	17	dBm
	802.11AX HE20@MCS 11	21	20	19	dBm

	802.11AX HE40@MCS 11	20	19	18	dBm
	802.11AX HE80@MCS 11	19	18	17	dBm

6 Description of power supply and power consumption

	Testing Condition	Minimum Value	Rating Value	Maximum Value	Unit
Working Voltage(V)	T A = 25°C	6	12	14	V
Absolute operating voltage(V)	T A = 25°C	5.5		16	V
Working Currency(A)	VIN=12V, T A = 25°C	0.6	0.8	2	A

Please use the ZBT standard power adapter to supply power to this product. If you do not use the ZBT standard power supply, please supply power to this product in strict accordance with the above power specifications and parameters, otherwise the product will be damaged. If the battery or vehicle power supply is used for power supply, please take anti-static and anti-surge measures.

7 Introduction of structural parameters and accessorie

Weight(KG)	TBD	
Enclosure size	L*W*H=232MM*255MM*110MM	
Color	Space Grey	
Accessories	Power Adapter	Standard POE Power,NO adatper
	User Manual	1pc
	Certificate	1pc
	Network cable	1pc Cat 5 network cable

8 Product working condition requirements

Working	-20℃ - 60℃

Temperature	
Storage Temperature	-40℃ - 70℃
Working Humidity	10% - 90%RH Non condensing
Storage Humidity	5% - 90%RH Non condensing

10 Software configuration information

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

Above information is general default configuration of the product. WiFi SSID maybe different with our ZBT firmware or OpenWrt firmware, but default IP and web login name/password of the product remain same. Please refer to the product description for more software functions.