
User manual

Product Name: MOFI6500

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1 overview

1.1 Brief overview

This document describes the electrical characteristics, RF performance, dimensions, and application environment of the MOFI6500. This document provides end users or developers with a quick overview of the hardware features of the MOFI6500.

MOFI6500 is a WIFI6 home/commercial CPE routing, 1000Mbps WAN port access to the Internet, and then through wireless WiFi 6 and 1000Mbps wired LAN to share the Internet network.

1.2 Reference standard

Relevant standard specification:

- USB3.0/USB2.0 General 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

2 Main features of product

- Adopt MT7981B scheme, ARM Cortex-A53 dual-core CPU, main frequency up to 1.3GHZ
- Independent WIFI6 chip, MT7976DAN, speed up to 3000Mbps
- It uses high-speed 1GB DDR4 with 128MB SPI NAND Flash
- 1WAN+3LAN 1000M adaptive network port, supporting Auto MDI/MDIX...
- Support "one-key brush mode", that is, long press the reset button to enter the rescue brush mode...
- Built-in 2 M.2 standard interfaces, support USB3.0 bus and PCIE bus can be used to connect to 5G mobile communication modules
- External 2 standard Nano SIM card (small card) interface, supporting SIM/USIM card
- External high-gain WIFI antenna, wireless signal 360 degrees without dead Angle

3 Hardware function

3.1 Hardware interface introduction

Net interface	WAN port 1, 1000Mbps Support automatic rollover (Auto MDI/MDIX) Conform to IEEE 802.3/802.3u/802.ab
	LAN port 3, 1000Mbps Support automatic rollover (Auto MDI/MDIX) Conform to IEEE 802.3/802.3u/802.ab
Power interface	DC5.5*2.1MM interface 1, 4PIN Vehicle power supply interface 1
key	Reset key 1
Switch	LED Power control toggle switch 1
USB interface	USB3.0 Type-A interface 1, USB2.0 Type-A interface 1
Console interface	RJ45 interface 1
antenna	External omnidirectional 5.34dbi 2.4GWIIIF antennas 2
	External omnidirectional 5.34dbi 5.8GWIFI antennas 3

3.2 Indicator function Description

POWER LED	The power supply of the device is usually on, but abnormally off
Internet LED	The network of the device is normally lit
2.4G WIFI LED	2.4G WiFi is on normally and data transmission blinks
5.8G WIFI LED	2.4G WiFi is on normally and data transmission blinks
WAN LED	The WAN link is on and data transmission blinks

(Note: The above LED definition is subject to the customer's actual firmware definition)

3.3 Hardware platform introduction

processor	MT7981B ARM Cotext-A53 dikaryon CPU, 1.3GHZ Dominant frequency
WIFI chip	MT7976DAN IEEE 802.11n/g/b/a/ac/ax, Maximum speed 3000Mbps
Internal memory	DDR4 1GB
Flash memory	Nor Flash 16MB(selectable)
	SPI NAND Flash 128MB
	EMMC 8GB(selectable)

3.4 Hardware watchdog function description

This hardware product is designed with the hardware watchdog function. After being powered 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 shuts itself down for 15 seconds and then reboots the entire system.

Hardware watchdog specific functions	
Routing system exception	Module dialing exception
Reboot the entire system	Restart only module

4 Description of power supply and power consumption

	Test condition	Minimum value	Rated value	Maximum value	unit
Operating voltage	$T_A = 25^{\circ}C$	9	12	35	V
Absolute operating voltage	$T_A = 25^{\circ}C$	8.5		36	V
Working current	$V_{IN}=12V, T_A = 25^{\circ}C$	0.6	2	3.5	A

Use the standard power adapter to power the product. If you do not use the standard power supply, strictly follow the preceding power supply specifications to power the product. Otherwise, the product will be damaged. If battery or vehicle power supply is used, please be sure to take anti-static and anti-surge countermeasures.

5 WIFI Wireless parameters

5.1 WIFI EVM index

	Schema declaration	Index parameter	unit
EVM index	802.11B 11Mbps	$\leq -15\text{ dB}$	dBm
	802.11G 54 Mbps	$\leq -25\text{ dB}$	dBm
	802.11N HT20@ MCS7	$\leq -28\text{ dB}$	dBm
	802.11N HT40@ MCS7	$\leq -28\text{ dB}$	dBm
	802.11AC VHT20@ MCS8	$\leq -30\text{ dB}$	dBm
	802.11AC VHT40@ MCS9	$\leq -32\text{ dB}$	dBm
	802.11AC VHT80@ MCS9	$\leq -32\text{ dB}$	dBm
	802.11AX HE20@MCS 11	$\leq -35\text{ dB}$	dBm

	802.11AX HE40@MCS 11	≤ -35 dB	dBm
	802.11AX HE80@MCS 11	≤ -35 dB	dBm

5.2 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 value	Rated value	Minimum value	unit
Operating 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	-68	-70	-72	dBm
	802.11AC VHT20@ MCS8	-66	-68	-70	dBm
	802.11AC VHT40@ MCS9	-63	-65	-67	dBm
	802.11AX HE20@MCS11	-60	-62	-64	dBm
	802.11AX HE40@MCS11	-58	-60	-62	dBm
Transmitting power	802.11B 11Mbps	22	24	26	dBm
	802.11G 54 Mbps	21	22	23	dBm
	802.11N HT20@ MCS7	20	21	22	dBm
	802.11N HT40@ MCS7	19	20	21	dBm
	802.11AC VHT20@ MCS8	18	19	20	dBm
	802.11AC VHT40@ MCS9	17	18	19	dBm
	802.11AX HE20@MCS11	17	18	19	dBm

	802.11AX HE40@MCS11	16	17	18	dBm
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5.3 WIFI 5.8G

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

	Instructions	Maximum value	Rated value	Minimum value	unit
Operating frequency		5825		5180	MHz
Receiving sensitivity	802.11G 54 Mbps	-72	-74	-76	dBm
	802.11N HT20@ MCS7	-70	-72	-74	dBm
	802.11N HT40@ MCS7	-68	-70	-72	dBm
	802.11AC VHT20@ MCS8	-66	-68	-70	dBm
	802.11AC VHT40@ MCS9	-63	-65	-67	dBm
	802.11AX HE20@MCS11	-60	-62	-64	dBm
	802.11AX HE40@MCS11	-58	-60	-62	dBm
	802.11AX HE80@MCS11	-55	-57	-59	dBm
Transmitting power	802.11G 54 Mbps	21	22	23	dBm
	802.11N HT20@ MCS7	20	21	22	dBm
	802.11N HT40@ MCS7	19	20	21	dBm
	802.11AC VHT20@ MCS8	18	19	20	dBm
	802.11AC VHT40@ MCS9	17	18	19	dBm
	802.11AX HE20@MCS11	17	18	19	dBm
	802.11AX HE40@MCS11	16	17	18	dBm

	802.11AX HE80@MCS11	16	17	18	dBm
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6 Structural parameters and accessories are introduced

Weight (KG)	TBD	
Case size	L*W*H= X * X * X MM	
Color matching	black	
attachment	Power adapter	12V/3.5A 1PCS
	specification	1PCS
	Certificate of conformity	1PCS
	Net cable	8P8C Net cable 1PCS

7 Product working environment requirements

Operating temperature	-20℃ - 60℃
Storage temperature	-40℃ - 70℃
Working humidity	10% - 90%RH(non-condensing)
Storage humidity	5% - 90%RH (non-condensing)

8 Software configuration information

Acquiesce IP	192.168.1.1
User name/password	root/admin
2.4G SSID	WIFI6-XXXXXX (X indicates the last six bits of the MAC address), Default no password
5.8G SSID	WIFI6-5G-XXXXXX (X indicates the last six bits of the MAC address), Default no password

The above is the conventional 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.

9 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.

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.

10 IC warning

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.