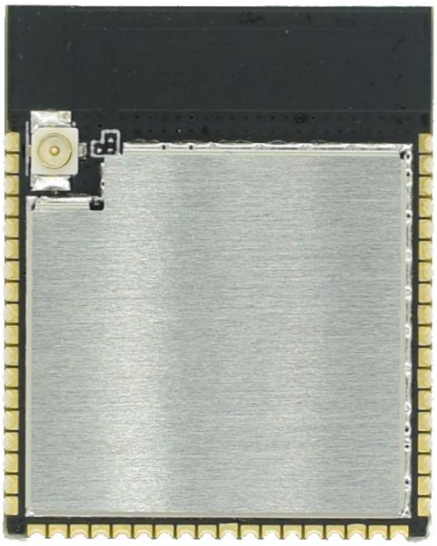
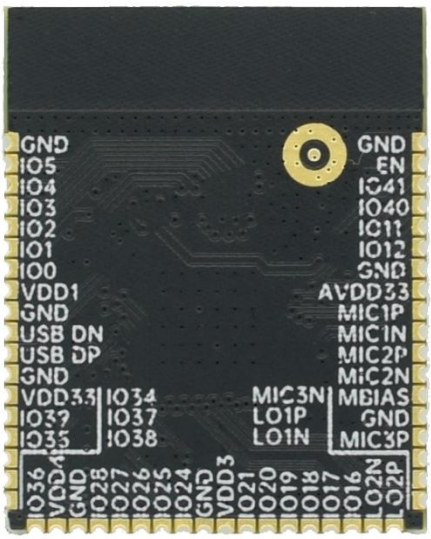
Sipeed M1A Datasheet v1.0





Product name：IOT WiFi module

Product model：M1A

Characteristic:

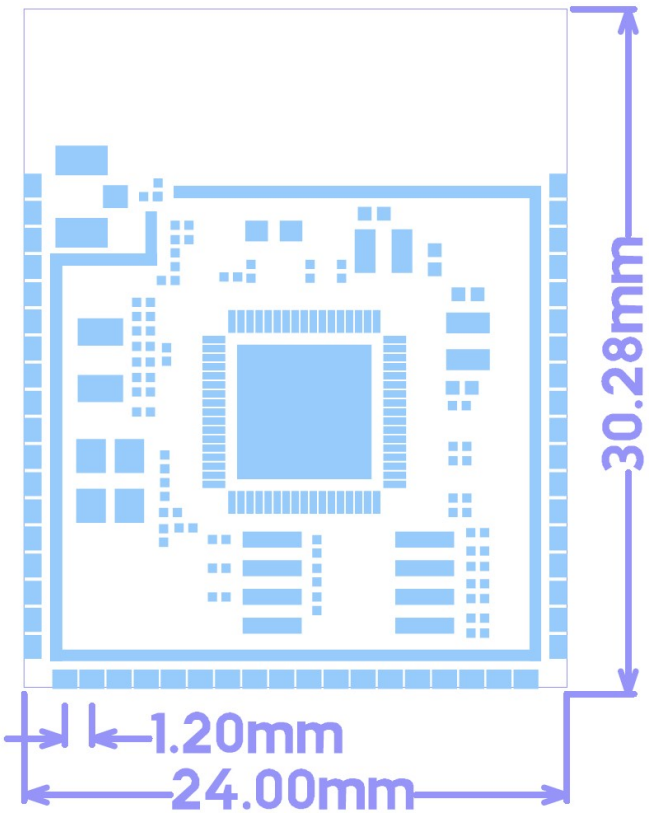
- BL606P RISC-V 480MHz
- Onboard SPI FLASH（16MByte default）
- Support 2.4Ghz WIFI
- Support PCB board antenna
- Stamp hole leads out all functional IO

Update record of this document	
V1.0	Edited on November 22, 2022; Original document

Hardware overview	
BL606P processor	Multi RISC-V CPUs (Max Freq 480Mhz)
	700KB SRAM
	Encoding and decoding: - MJPEG and H264(Baseline/Main) - 1920x1080@30fps + 640x480@30fps
	Interface: - USB 2.0 HS OTG - SDIO - 4 UART (Support RS485, ISO 17987-8, ISO11898-1) - 2 SPI (Max Freq 80Mhz) - 4 I2C - 8 PWM channel - I2S - PDM - 12-bit General ADC - 10-bit General DAC - General analog comparator (ACOMP) - PIR (Passive infrared) detector
	Wireless: - Support Wi-Fi 802.11 b/g/n - Wi-Fi Frequence : 2400 ~ 2483.5Mhz
Onboard component	Onboard SPI FLASH (16MByte default)
	Support PCB board antenna

Working conditions	
Power supply demand	- The modules can work only when AVDD33_CODEC/VDDIO3/VDDIO4/VDD33/VDDIO1 power supplies are supplied - Rated power：1W
Temperature rise	<30K
Operating ambient temperature range	-10℃ ~ 65℃

Dimension information	
Length	30.0 mm
Width	24.0mm
Thickness	Please check the 3D drawing



Matters needing attention	
ESD protection	Please pay attention to avoid static electricity hitting PCBA Please release the static electricity from the handle before contacting PCBA When designing the PCB board, you must take the following measures to protect M1s module : Series resistance, Use ESD diode, etc
Tolerance voltage	The working voltage of each GPIO has been marked in the schematic . Please do not let the actual working voltage of GPIO exceed the rated value, otherwise it will cause permanent damage to PCBA
Avoid short circuit	Please avoid any liquid or metal touching the pads of components on PCBA during power on, otherwise it will cause short circuit and burn PCBA
Design suggestions	https://bbs.sipeed.com/thread/1721
BANK	VDDIO1 : GPIO0-8 , 1.8V/3.3V VDDIO2 : GPIO 11-15 , GPIO 40-41 3.3V only VDDIO3 : GPIO 16-23 , 1.8V/3.3V VDDIO4 : GPIO 24-39 , 1.8V/3.3V
BOOT mode	During startup, the chip determines the voltage of BOOT pin and selects one of two startup options - BOOT pin = 1： Boot from SPI FLASH - BOOT pin = 0： Enter UART download mode

Resources	
Official website	www.sipeed.com
Github	https://github.com/Sipeed
BBS	http://bbs.sipeed.com
Wiki	wiki.sipeed.com
Sipeed Model platform	https://maixhub.com/
SDK /HDK Relevant information	https://dl.sipeed.com/
Bouffalolab document	https://dev.bouffalolab.com/home/
E-mail (Technical support and business cooperation)	support@sipeed.com

Federal Communication Commission Statement (FCC, U.S.)

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 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 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 Caution:

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

FCC Radiation Exposure Statement:

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.

IMPORTANT NOTES

Co-location warning:

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

OEM integration instructions:

This device is intended only for OEM integrators under the following conditions:

The transmitter module may not be co-located with any other transmitter or antenna. The module shall be only used with the external antenna(s) that has been originally tested and certified with this module.

As long as the conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

Validity of using the module certification:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization for this module in combination with the host

equipment is no longer considered valid and the FCC ID of the module cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End product labeling:

The final end product must be labeled in a visible area with the following: “Contains Transmitter Module FCC ID: 2AS7P-SIPEED-M1A”.

Information that must be placed in the end user manual:

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

Integration instructions for host product manufactures according to KDB 996369 D03 OEM Manual v01

2.2 List of applicable FCC rules

FCC Part 15 Subpart C 15.247

2.3 Specific operational use conditions

The module is a module with 2.4G wifi function.

WiFi Specification：

Operation Frequency: 2412~2462MHz
Number of Channel: 11
Modulation: DSSS, OFDM
Type: PCB Antenna
Gain: 0.43dBi

The module can be used for mobile or applications with a maximum 0.43dBi antenna. The host manufacturer installing this module into their product must ensure that the final composit product complies with the FCC requirements by a technical assessment or evaluation to the FCC rules, including the transmitter operaition. The host manufacturer has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which

integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

2.4 Limited module procedures

Not applicable. The module is a single module and complies with the requirement of FCC Part 15.212/ RSP-100.

2.5 Trace antenna designs

Not applicable. The module has its own antenna, and doesn ′ t need a host ′ s printed board microstrip trace antenna etc.

2.6 RF exposure considerations

The module must be installed in the host equipment such that at least 20cm is maintained between the antenna and users ′ body; and if RF exposure statement or module layout is changed, then the host product manufacturer required to take responsibility of the module through a change in FCC ID or new application. The FCC ID of the module cannot be used on the final product. In these circumstances, the host manufacturer will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization

2.7 Antennas

Antenna Specification are as follows:
Type: PCB Antenna
Gain: 0.43dBi
This device is intended only for host manufacturers under the following conditions: The transmitter module may not be co-located with any other transmitter or antenna; The module shall be only used with the internal antenna(s) that has been originally tested and certified with this module. The antenna must be either permanently attached or employ a ‘unique ′ antenna coupler.
As long as the conditions above are met, further transmitter test will not be required. However, the host manufacturer is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.)

2.8 Label and compliance information

Host product manufacturers need to provide a physical or e-label stating “Contains Transmitter Module FCC ID: 2AS7P-SIPEED-M1A” with their finished product.

2.9 Information on test modes and additional testing requirements

WIFI

Operation Frequency: 2412~2462MHz
Number of Channel: 11
Modulation: DSSS, OFDM

Host manufacturer must perfom test of radiated & conducted emission and spurious emission, etc according to the actual test modes for a stand-alone modular transmitter in a host, as well as for multiple simultaneously transmitting modules or other transmitters in a host product. Only when all the test results of test modes comply with FCC requirements, then the end product can be sold legally.

2.10 Additional testing, Part 15 Subpart B disclaimer

The modular transmitter is only FCC authorized for FCC Part 15 Subpart C 15.247 and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. If the grantee markets their product as being Part 15 Subpart B compliant (when it also contains unintentional radiator digital circuity), then the grantee shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.