



**SinoVoip CO.,LTD**

**Banana PI BPI-M3**  
**User Manual**  
<Version: V1.0 >





## Banana PI M3 User Manual

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Banana PI BPI-M3 is the open source hardware platform, Banana PI BPI-M3 is an octa-core version of Banana Pi, Banana PI BPI-M3 is the octa core better than the Banana Pi BPI-M1, it support WIFI+BT on board.

Banana Pi BPI-M3 series run Android, Debian linux, Ubuntu linux, Raspberry Pi image and others OS.

Banana PI BPI-M3 hardware: 1.8GHz ARM Cortex-A7 octa-core processor, 2GB LPDDR3 SDRAM,

Banana PI BPI-M3 with Gigabit Ethernet port, It can run with Android 4.4 smoothly. The size of Banana PI BPI-M3 same as banana pi M1, it can easily run with the game it support 1080P high definition video output, the GPIO compatible with Raspberry Pi B+ and can run the ROM Image



## Banana PI M3 User Manual

### Hardware Specification of Banana pi BPI-M3

Soc	A83T ARM <a href="#">Cortex-A7</a>
CPU	A83T ARM <a href="#">Cortex-A7</a> octa-core, 512 KB L1 cache 1 MB L2 cache
GPU	PowerVR SGX544MP1· Comply with OpenGL ES 2.0, OpenCL 1.x, DX 9_3
SDRAM	2GB LPDDR3 (shared with GPU)
Power	5V @ 2A via DC power and/or MicroUSB (OTG)

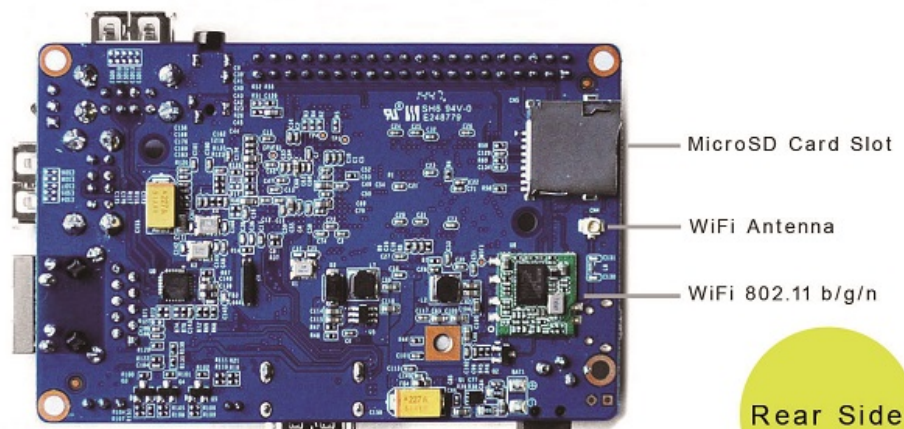
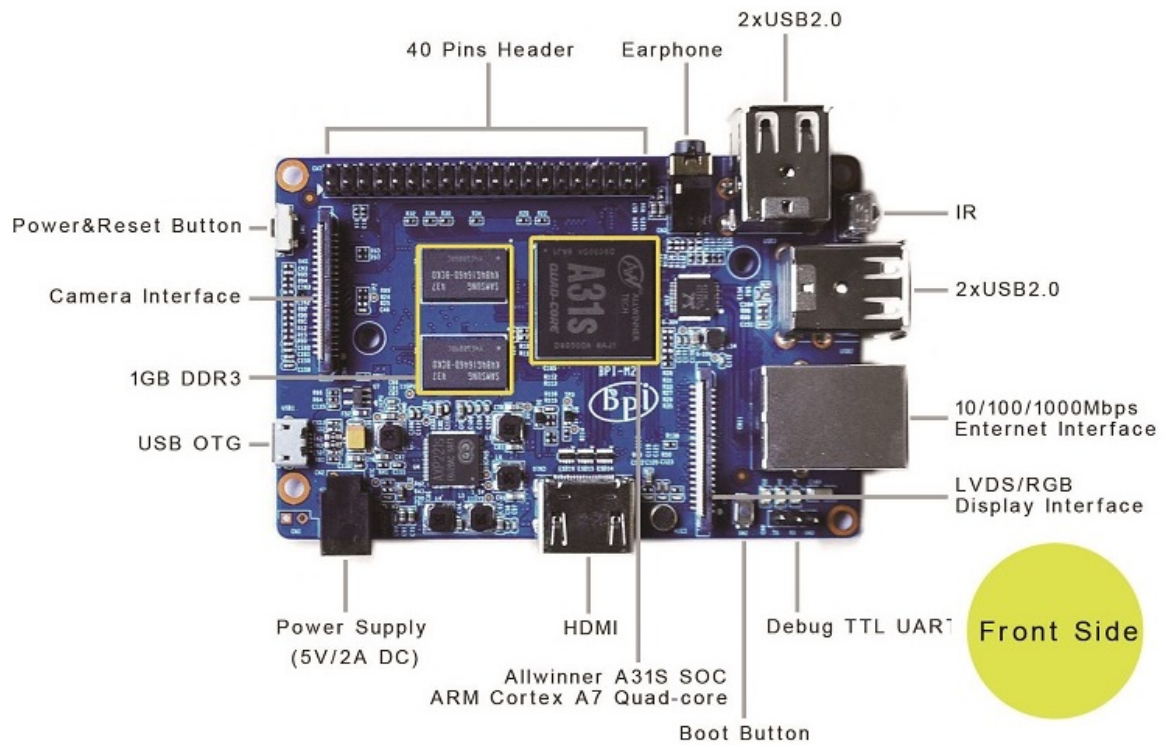
### Features

Low-level peripherals	40 Pins Header, 28×GPIO, some of which can be used for specific functions including UART, I2C, SPI, PWM, I2S.
On board Network	10/100/1000Mbps ethernet (Realtek RTL8211E/D)
Wifi Module	WiFi 802.11 b/g/n (AP 6212 module on board)
Bluetooth	BT4.0
On board Storage	MicroSD (TF) card, SATA2.0, eMMC
Display	Supports multi-channel HD display: HDMI 1.4 (Type A - full) MIPI Display Serial Interface (DSI) for raw LCD panels 11 HDMI resolutions from 640×480 to 1920×1200
Video	Multi-format FHD video decoding, including Mpeg1/2, Mpeg4, H.263, H.264, etc H.264 high profile 1080p@60fps or 720p@120fps encoding HEVC/H.265 decoder 1080P@30fps with software
Audio outputs	HDMI, analog audio (via 3.5 mm TRRS jack), I2S audio (also potentially for audio input)
Camera	Parallel 8-bit camera interface MIPI Camera serial Interface (CSI)
Audio input	On board microphone
USB	2 USB 2.0 host, 1 USB 2.0 OTG
Buttons	Reset button, Power button, U-boot button
Leds	Power status Led and RJ45 Led
Other	IR receiver
Interface definition	
Sizes	92 mm × 60mm
Weight	45g



## Banana PI M3 User Manual

### Interface:





### Use method

#### Step 1: Get what you need

First time to enjoy your Banana Pi, you need at least the accessories in the table below.

No.	Item	Minimum recommended specification & notes
1	TF card	<ul style="list-style-type: none"><li>Minimum size 4Gb; class 4 (the class indicates how fast the card is).</li><li>We recommend using branded SD cards as they are more reliable.</li></ul>
2a	HDMI(Full sized) to HDMI / DVI lead	<ul style="list-style-type: none"><li>HDMI to HDMI lead (for HD TVs and monitors with HDMI input).</li><li>OR</li><li>HDMI to DVI lead (for monitors with DVI input).</li></ul>
2b	AV video lead	<ul style="list-style-type: none"><li>A standard AV video lead to connect to your analogue display if you are not using the HDMI output.</li></ul>
3	Keyboard and mouse	<ul style="list-style-type: none"><li>Any standard USB keyboard and mouse should work.</li><li>Keyboards or mice that take a lot of power from the USB ports, however, may need a powered USB hub. This may include some wireless devices.</li></ul>
4	Ethernet cable/USB WiFi(Optional)	<ul style="list-style-type: none"><li>Networking is optional, although it makes updating and getting new software for your Banana Pi much easier.</li></ul>
5	Micro USB power adapter	<ul style="list-style-type: none"><li>A good quality, micro USB power supply that can provide at least 700mA at 5V is essential.</li><li>Many mobile phone chargers are suitable—check the label on the plug.</li></ul>
6	Audio lead (Optional)	<ul style="list-style-type: none"><li>You can choose a 3.5mm jack audio lead to connect to audio port to get stereo audio.</li></ul>
7	Mobile Hard disk (Optional)	<ul style="list-style-type: none"><li>You can choose to connect a mobile hard disk to usb port to store more files.</li></ul>



## Banana Pi M3 User Manual

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HDMI to HDMI lead



HDMI to DVI lead



AV video lead



SD card



Micro USB power adapter

### Step 2: Download the relevant Image file:

Please visit our webmaster: [www.bananapi.com](http://www.bananapi.com) to download image, banana pi all image can be download form this web.

### Step3: Prepare your SD card for the Banana Pi M3

In order to enjoy your Banana Pi M3, you will need to install an Operating System (OS) onto an SD card. Instructions below will teach you how to write an OS image to your SD card under Windows and Linux.

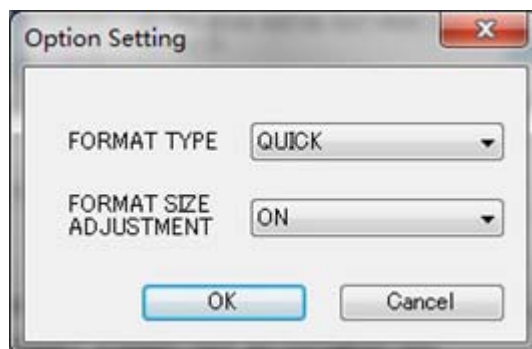
1. Insert your SD card into your computer. The size of SD should be larger than the OS image size, generally 4GB or greater.
2. Format the SD card.

### Windows:

Download the a SD card format tool such as **SD Formatter** from

[https://www.sdcard.org/downloads/formatter\\_4/eula\\_windows/](https://www.sdcard.org/downloads/formatter_4/eula_windows/)

- i. Unzip the download file and run the setup.exe to install the tool on your machine.
- ii. In the "Options" menu, set "FORMAT TYPE" option to QUICK, "FORMAT SIZE ADJUSTMENT" option to "ON".



- iii. Check that the SD card you inserted matches the one selected by the Tool.
- iv. Click the "Format" button.

### Linux:





- v. Run *fdisk -l* command to check the SD card node.
- vi. Run *sudo fdisk /dev/sd~~x~~* command to delete all partition of SD card.
- vii. Run *mkfs -t vfat /dev/sd~~x~~* command to format the entire SD card as FAT.

(x should be replaced according to your SD card node)

- 3. Download the OS image from Download district.
- 4. Unzip the download file to get the OS image.

**Windows:** Right click on the file and choose “Extract all”.

**Linux:** Run *unzip [downloaded filename]* command.

- 5. Write the image file to the SD card.

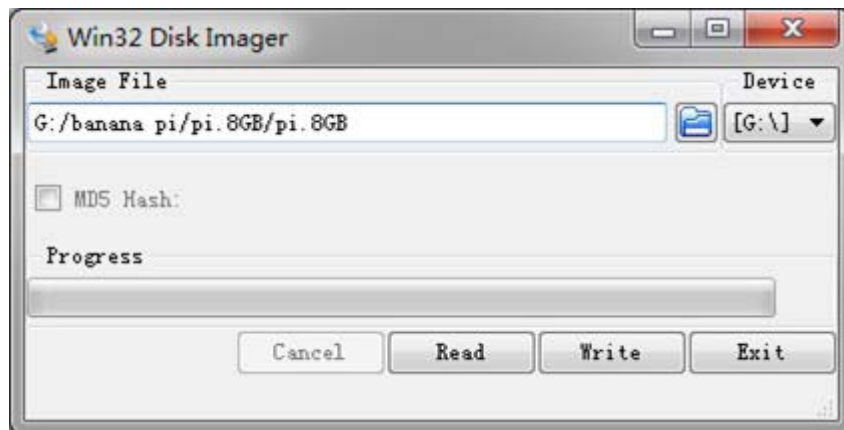
**Windows:**

- i. Download a tool that can write image to SD card, such as **Win32**

**Diskimager** from:

<http://sourceforge.net/projects/win32diskimager/files/Archive/>

- ii. Open the unzipped image file.



- iii. Click Write button. Wait patiently to successfully complete writing.





### Linux:

- iv. Run `fdisk -l` command to check the SD card node.
- v. Run `dd if=[imagename] of=/dev/sdx` command to write image file to SD card. Wait patiently to successfully complete writing.

### Step4: Set up your Banana Pi M3

According to the set up diagram below, you can easily set up your Banana Pi.

1. Insert the written-image SD card that to the SD card spot on the left side edge of the underside of the board.
2. On the bottom "edge" in the middle of the board is the HDMI Type A (Full sized) port. Just connect any HDMI cable from the board to your TV or HDMI Monitor.

If you don't have an TV/Monitor with a HDMI or DVI-D port you can use the yellow AV jack located in the middle of the "top" edge and the 3.5 mm stereo headphone jack to the right of it.

3. Plug a USB keyboard and mouse into the USB slots located on the right edge.
4. Just under the USB ports on the right edge is the ethernet connector for anyone who wants to plug the Banana Pi into a wired network.
5. Finally, at the very left of the bottom edge is the micro-usb power connector. Plug in a regulated power supply that is rated at  $5V \pm 5\%$  and at least 700mA (or 0.7A). Any number bigger than 700 mA (like 1000mA) will also work. Avoid using the smaller chargers used for small GSM phones, as these are often unregulated, even if they claim "5V 1A", they may do "5V" and may do "1A", but not at the same time!

The mini-USB (on the left) is the wrong one. It's thicker and looks like a trapezoid with its sides pinched in. The micro-USB (on the right) is the



## Banana PI M3 User Manual

correct one. It is thinner and also looks like a trapezoid except it's sides are rounded outward.



If all goes well, the Banana Pi will boot in a few minutes. The screen will display the OS GUI.





### Step5: Shut down your Banana Pi M3

You can use the GUI to shut down the Banana Pi safely.

Also you can run the command in the terminal:

**sudo halt**

or

**sudo shutdown -h.**

This will shut down the PI safely, (just use the power key to turn off might damage the SD-cards file system). After that you can press the power key for 5 seconds to turn it off.

**If all is well ,so you can use banana pi M3 now.**

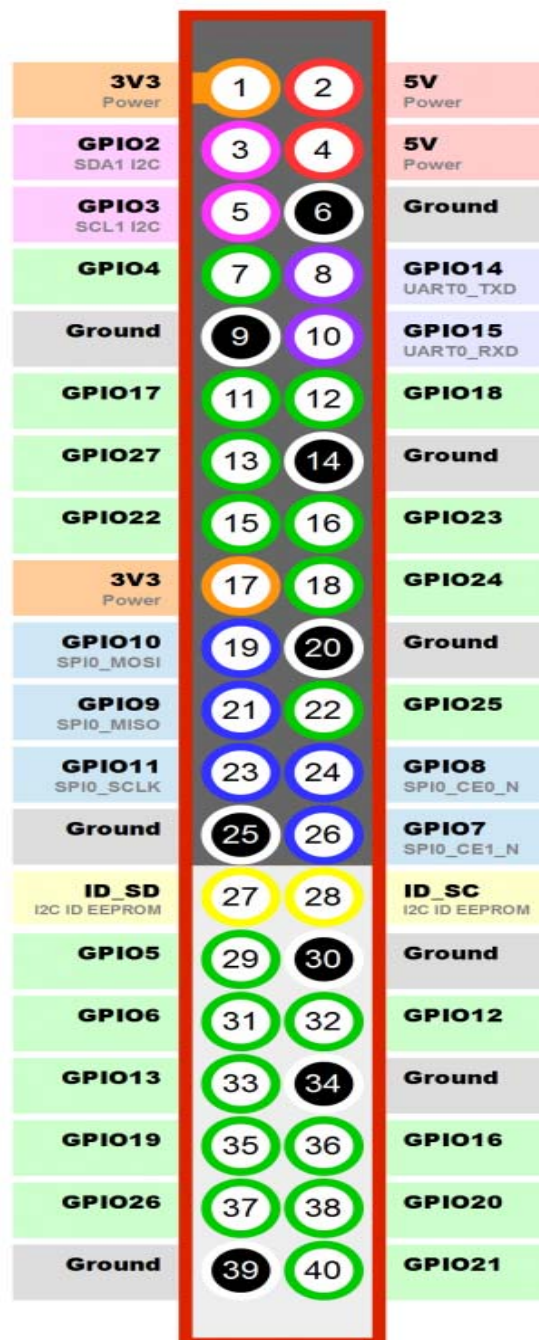


## Banana Pi M3 User Manual

### GPIO specification

#### Banana Pi 40-pin GPIO

Banana Pi has a 40-pin GPIO header that matches that of the Model B+ Raspberry Pi. Following is the Banana Pi GPIO Pinout:



[www.bananapi.com](http://www.bananapi.com) [www.banana-pi.com](http://www.banana-pi.com)



## Banana PI M3 User Manual

GPIO Pin Name	Default Function	Function2: GPIO	Function3
CON1-P01	VCC-3V3		
CON1-P02	DCIN		
CON1-P03	TWI2-SDA	PH5-EINT5	
CON1-P04	DCIN		
CON1-P05	TWI2-SCK	PH4-EINT4	
CON1-P06	GND		
CON1-P07	S-PWM	PL10-S-EINT10	
CON1-P08	UART2-TX	PB0-EINT0	
CON1-P09	GND		
CON1-P10	UART2-RX	PB1-EINT1	
CON1-P11	PC4	PC4	
CON1-P12	UART2-CTS	PB3-EINT3	
CON1-P13	PC7	PC7	
CON1-P14	GND		
CON1-P15	PC17	PC17	
CON1-P16	UART2-RTS	PB2-EINT2	
CON1-P17	VCC-3V3		
CON1-P18	PL8-ENT8	PL8-S-ENT8	
CON1-P19	SPI0_MOSI	PC0	
CON1-P20	GND		
CON1-P21	SPI0_MISO	PC1	
CON1-P22	PL9-EINT9	PL9-S-EINT9	
CON1-P23	SPI0_CLK	PC2	
CON1-P24	SPI0_CS	PC3	
CON1-P25	GND		
CON1-P26	PH10-ENT10	PH10-ENT10	
CON1-P27	TWI1-SDA	PH3-EINT3	
CON1-P28	TWI1-SCK	PH2-EINT2	
CON1-P29	PC18	PC18	
CON1-P30	GND		
CON1-P31	I2S1-BCLK	PG10-EINT10	UART3-TX
CON1-P32	I2S1-DIN	PG13-EINT13	UART3-CTS
CON1-P33	I2S1-LRCK	PG11-EINT11	UART3-RX
CON1-P34	GND		
CON1-P35	I2S1-DOUT	PG12-EINT12	UART3-RTS
CON1-P36	PE5	PE5	
CON1-P37	PE4	PE4	
CON1-P38	OWA-DOUT	PE18	



## Banana PI M3 User Manual

CON1-P39	GND		
CON1-P40	PE19	PE19	

### CSI Camera Connector specification:

#### CSI Camera Connector

The CSI Camera Connector is a 40-pin FPC connector which can connect external camera module with proper signal pin mappings. The pin definitions of the CSI interface are shown as below. This is marked on the Banana Pi board as “CSI” .

CSI Pin Name	Default Function	Function2: GPIO
CN7-P01	IPSOUT	
CN7-P02	AFVCC	
CN7-P03	IPSOUT	
CN7-P04	IOVDD	
CN7-P05	GND	
CN7-P06	GND	
CN7-P07	CSI2-D3N	
CN7-P08	AVDD-CSI	
CN7-P09	CSI2-D3P	
CN7-P10	DVDD-CSI-R	
CN7-P11	GND	
CN7-P12	NC	
CN7-P13	CSI2-D2N	
CN7-P14	CSI-RST-R	PE16
CN7-P15	CSI2-D2P	
CN7-P16	CSI-STBY-R	PE17
CN7-P17	GND	
CN7-P18	CSI-PCLK	PE0
CN7-P19	CSI2-CKN	
CN7-P20	CSI-MCLK	PE1
CN7-P21	CSI2-CKP	
CN7-P22	CSI-HSYNC	PE2
CN7-P23	GND	
CN7-P24	CSI-VSYNC	PE3
CN7-P25	CSI2-D1N	



## Banana PI M3 User Manual

CN7-P26	CSI-D9	PE13
CN7-P27	CSI2-D1P	
CN7-P28	CSI-D8	PE12
CN7-P29	GND	
CN7-P30	CSI-D7	PE11
CN7-P31	CSI2-D0N	
CN7-P32	CSI-D6	PE10
CN7-P33	CSI2-D0P	
CN7-P34	CSI-D5	PE9
CN7-P35	GND	
CN7-P36	CSI-D4	PE8
CN7-P37	CSI-SCK	PE14
CN7-P38	CSI-D3	PE7
CN7-P39	CSI-SDA	PE15
CN7-P40	CSI-D2	PE6

### Display specification

#### MIPI DSI (Display Serial Interface)

The display Connector is a 40-pin FPC connector which can connect external LCD panel (MIPI DSI) and touch screen (I2C) module as well. The pin definitions of this connector are shown as below. This is marked on the Banana Pi board as “DSI” .

DSI Pin Name	Default Function	Function2: GPIO
CN6-P01	VCC-MIPI	
CN6-P02	IPSOUT	
CN6-P03	VCC-MIPI	
CN6-P04	IPSOUT	
CN6-P05	GND	
CN6-P06	IPSOUT	
CN6-P07	GND	
CN6-P08	IPSOUT	
CN6-P09	NC	
CN6-P10	GND	
CN6-P11	NC	
CN6-P12	DSI-D0N	
CN6-P13	NC	
CN6-P14	DSI-D0P	





## Banana PI M3 User Manual

CN6-P15	NC	
CN6-P16	GND	
CN6-P17	TWI0-SDA	PH1-EINT1
CN6-P18	DSI-D1N	
CN6-P19	TWI0-SCK	PH0-EINT0
CN6-P20	DSI-D1P	
CN6-P21	TP-INT	PL7-S-EINT7
CN6-P22	GND	
CN6-P23	TP-RST	PL6-S-EINT6
CN6-P24	DSI-CKN	
CN6-P25	GND	
CN6-P26	DSI-CKP	
CN6-P27	LCD-BL-EN	PD29
CN6-P28	GND	
CN6-P29	LCD-RST	PD26
CN6-P30	DSI-D2N	
CN6-P31	LCD-PWR-EN	PD27
CN6-P32	DSI-D2P	
CN6-P33	GND	
CN6-P34	GND	
CN6-P35	LCD-PWM	PD28
CN6-P36	DSI-D3N	
CN6-P37	GND	
CN6-P38	DSI-D3P	
CN6-P39	AP-RESET#	
CN6-P40	GND	

### UART specification:

The header CON4 is the UART interface. For developers of Banana Pi, this is an easy way to get the UART console output to check the system status and log message.

CON2 Pin Name	Default Function	GPIO
CON2 P03	UART0-TXD	PB8
CON2 P02	UART0-RXD	PB9
CON2 P01	GND	