



SinoVoip Co., Limited

Banana PI

User Manual



Banana Pi is the open source hardware platform which published to assist the Elastos.org open source OS, Banana Pi M1 is the dual core Android 4.2 product which is more better than the Raspberry Pi.

Banana Pi series run Android, Debian linux, Ubuntu linux, Raspberry Pi image and Cubieboard image.

Elastos coordinate multi CUP to form the family cloud environment which based on the "software/hardware service"

Banana Pi hardware: 1GHz ARM7 dual-core processor, 1GB DDR3 SDRAM,

Banana Pi with Gigabit ethernet port, SATA Socket. It can run with Android 4.2.2 smoothly. The size of Banana Pi M1 like the credit card, it can easily run with the game it support 1080P high definition video output, the GPIO compatible with Raspberry Pi and can run the ROM Image directly

Hardware specification

| | |
|-----------------|--|
| CPU | A20 ARM Cortex™-A7 Dual-Core |
| GPU | ARM Mali400MP2 Complies with OpenGL ES 2.0/1.1 |
| Memory (SDRAM) | 1GB DDR3 (shared with GPU) |
| Onboard Storage | SD (Max. 64GB) / MMC card slot UP to 2T on 2.5 SATA disk |
| Onboard Network | 10/100/1000 Ethernet RJ45, optional WIFI |
| Video Input | A CSI input connector allows for the connection of a designed camera module |
| Video Outputs | HDMI, CVBS , LVDS/RGB |
| Audio Output | 3.5 mm Jack and HDMI |
| Power Source | 5 volt via MicroUSB(DC In Only) and/or MicroUSB (OTG) |
| USB 2.0 Ports | 2 (direct from Allwinner A20 chip) |
| Buttons | Reset button: Next to MicroUSB connector Power button: Next to Reset button |

| | |
|----------------|--|
| | Boot button (Optional): Behind HDMI connector |
| GPIO(2X13) pin | GPIO,UART,I2C bus,SPI bus with two chip selects, CAN bus,ADC,PWM,+3.3v,+5v,ground. |
| LED | Power Key & RJ45 |
| Remote | IR (Optional) |
| OS | Android 4.2,Firefox OS and Linux etc. OS |

Interface definition

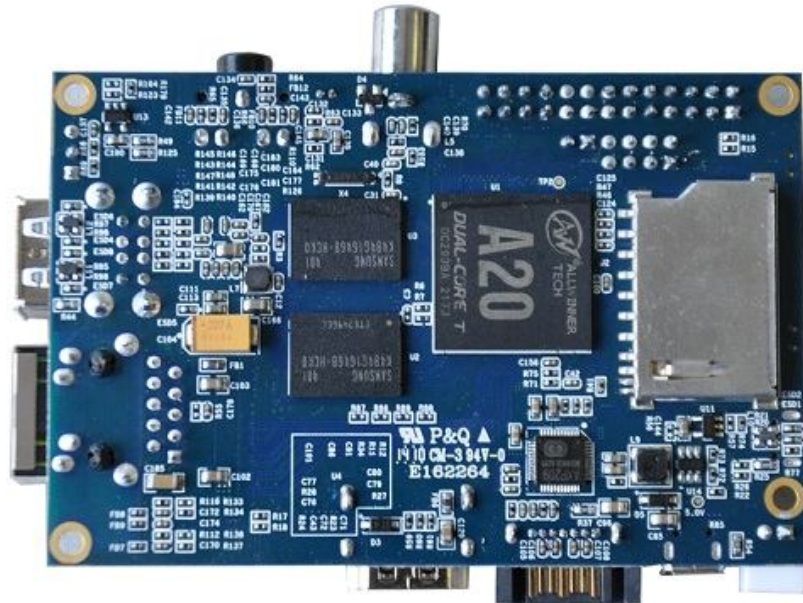
| | |
|--------------|--------------|
| Product size | 92 mm × 60mm |
| Weight | 48g |

Hardware

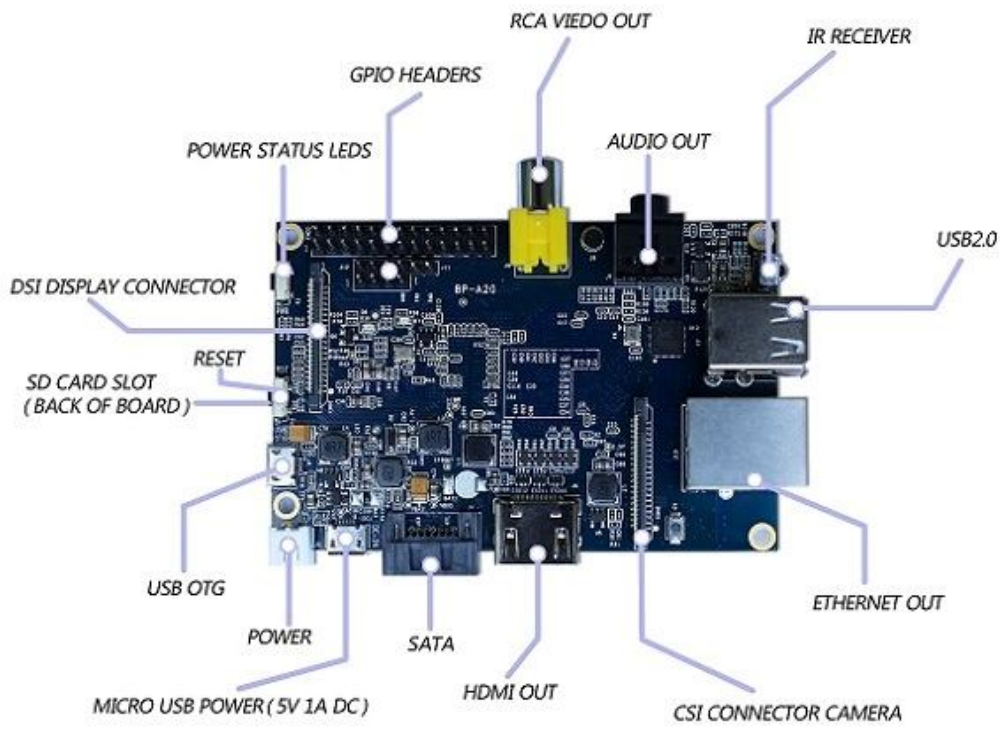
Front:



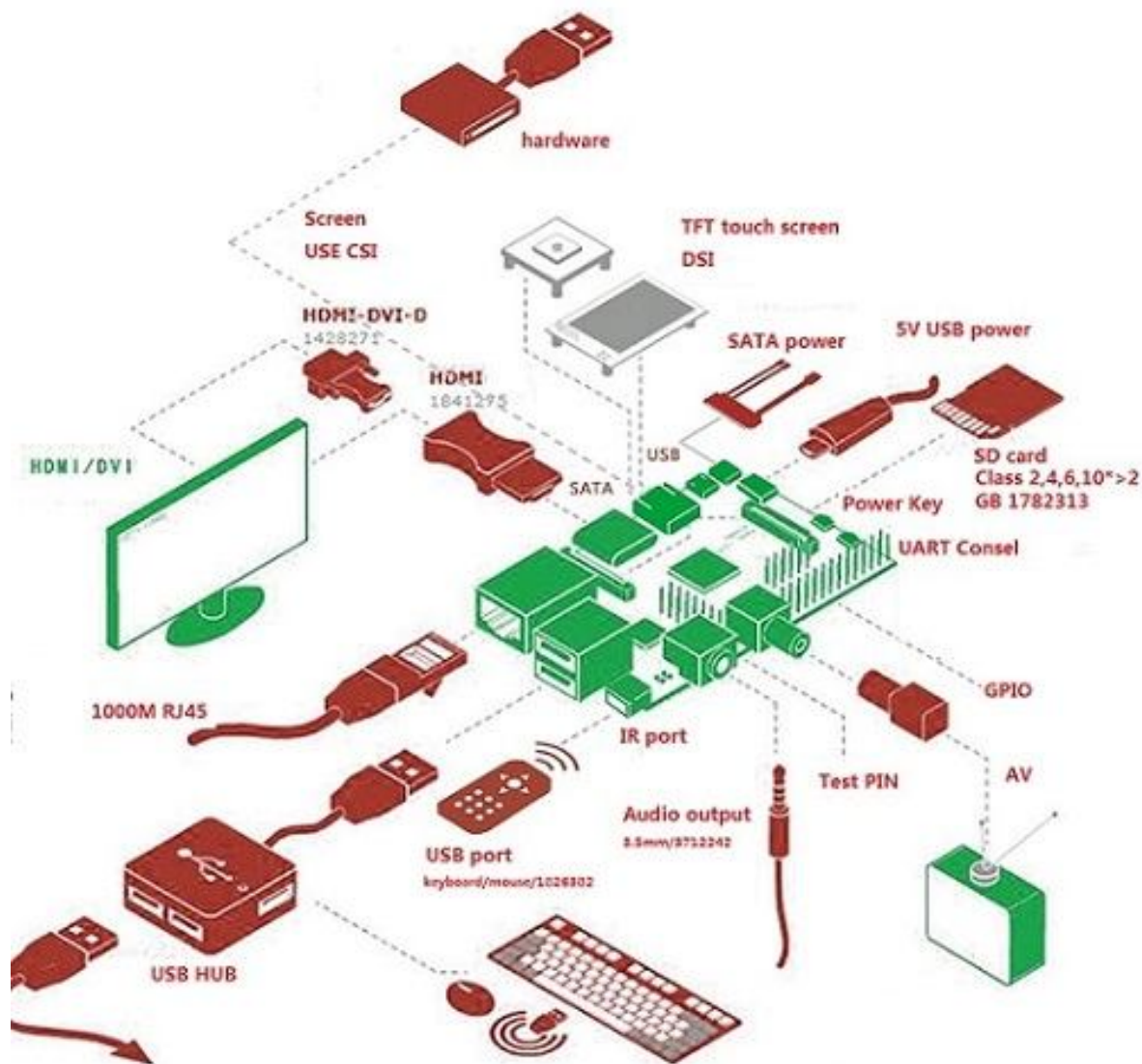
Back:



Interface :



Hardware connect sketch map



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 | Minimu recommended specification & notes |
|-----|------|--|
|-----|------|--|

- | | | |
|-----------|-------------------------------------|---|
| 1 | SD card | <ul style="list-style-type: none"> • Minimum size 4Gb; class 4 (the class indicates how fast the card is). • We recommend using branded SD cards as they are more reliable. |
| 2a | HDMI(Full sized) to HDMI / DVI lead | <ul style="list-style-type: none"> • HDMI to HDMI lead (for HD TVs and monitors with HDMI input). OR • HDMI to DVI lead (for monitors with DVI input). |
| 2b | AV video lead | <ul style="list-style-type: none"> • A standard AV video lead to connect to your analogue display if you are not using the HDMI output. |
| 3 | Keyboard and mouse | <ul style="list-style-type: none"> • Any standard USB keyboard and mouse should work. • 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. |
| 4 | Ethernet cable/USB WiFi(Optional) | <ul style="list-style-type: none"> • Networking is optional, although it makes updating and getting new software for your Banana Pi much easier. |
| 5 | Micro USB power adapter | <ul style="list-style-type: none"> • A good quality, micro USB power supply that can provide at least 700mA at 5V is essential. • Many mobile phone chargers are suitable—check the label on the plug. |
| 6 | Audio lead (Optional) | <ul style="list-style-type: none"> • You can choose a 3.5mm jack audio lead to connect to audio port to get stereo audio. |
| 7 | Mobile Hard disk (Optional) | <ul style="list-style-type: none"> • You can choose to connect a mobile hard disk to SATA port to store more files. |



Step 2: Download the relevant Image file:

Please visit our webmaster: www.banana-pi.org to download image ,banana pi all image can be downlad form this web.

Step3: Prepare your SD card for the Banana Pi

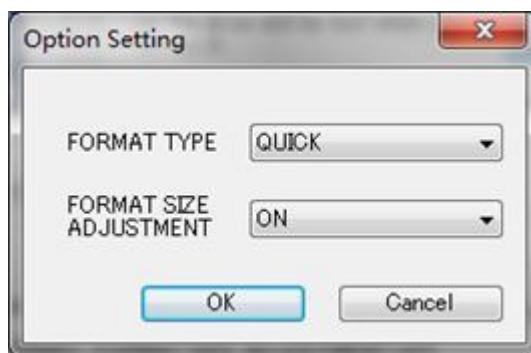
In order to enjoy your Banana Pi, you will need to install an Operating System (OS) onto an SD card. Instructions below will teach you how to write an OS image to your SD card under Windows and Linux.

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:

- i. Download the a SD card format tool such as **SD Formatter** from https://www.sdcard.org/downloads/formatter_4/eula_windows/
- ii. Unzip the download file and run the setup.exe to install the tool on your machine.

- iii. In the "Options" menu, set "FORMAT TYPE" option to QUICK, "FORMAT SIZE ADJUSTMENT" option to "ON".



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

Linux:

- vi. Run ***fdisk -l*** command to check the SD card node.
 - vii. Run ***sudo fdisk /dev/sdX*** command to delete all partition of SD card.
 - viii. Run ***mkfs -t vfat /dev/sdX*** 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.

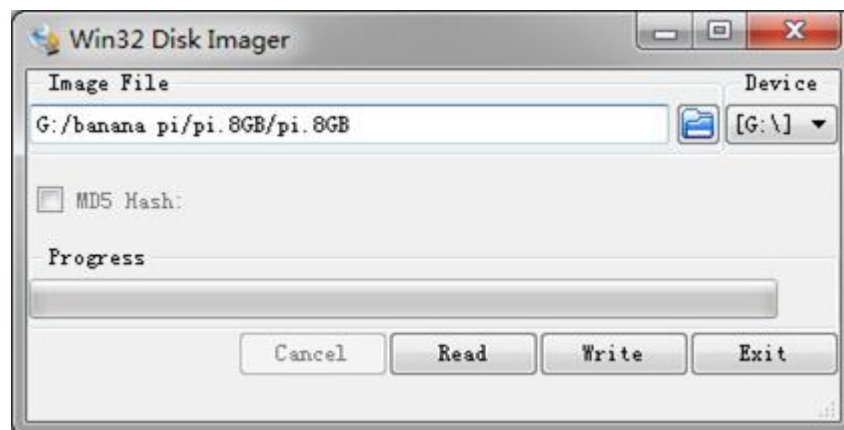
Windows:

- 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

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 on the right of the SATA 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 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

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.
```

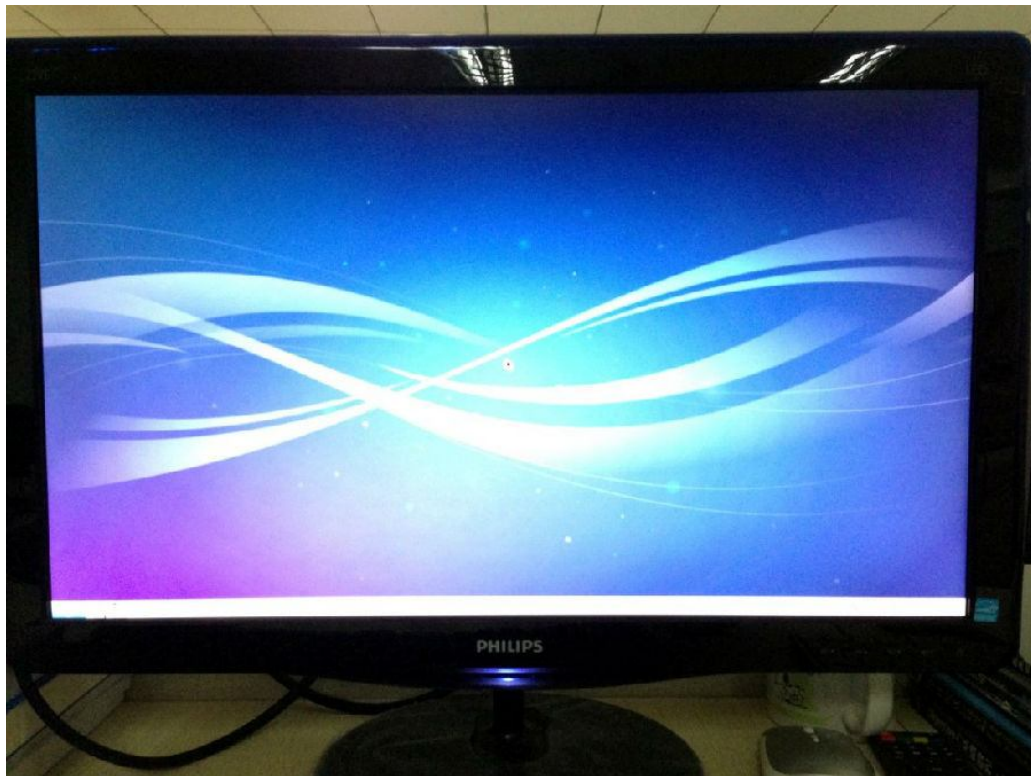
This will shut down the PI safely, (just use the power key to turn off might damage the SD-cards file system). After that you can press the power key for 5 seconds to turn it off.

If all is well ,the splash screen show as below

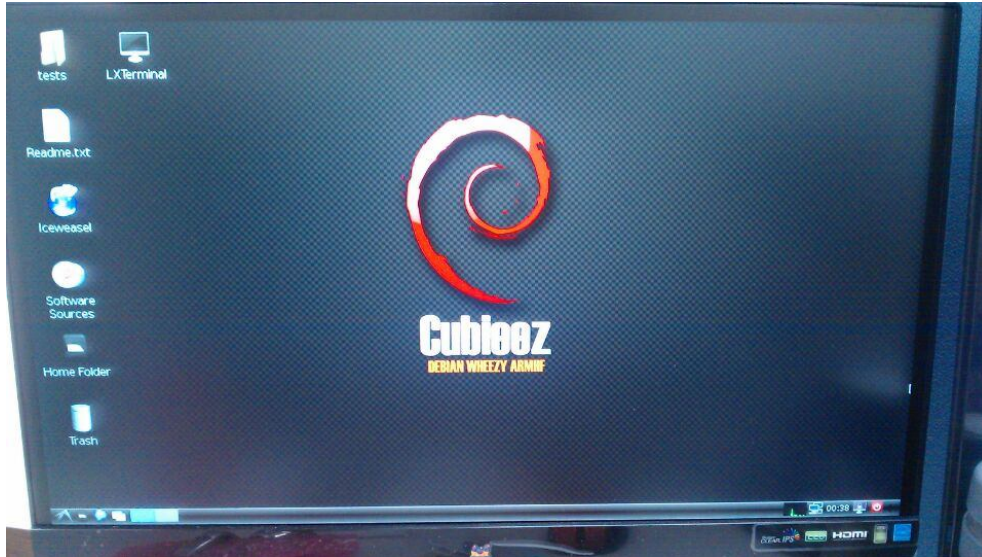
Android system screen



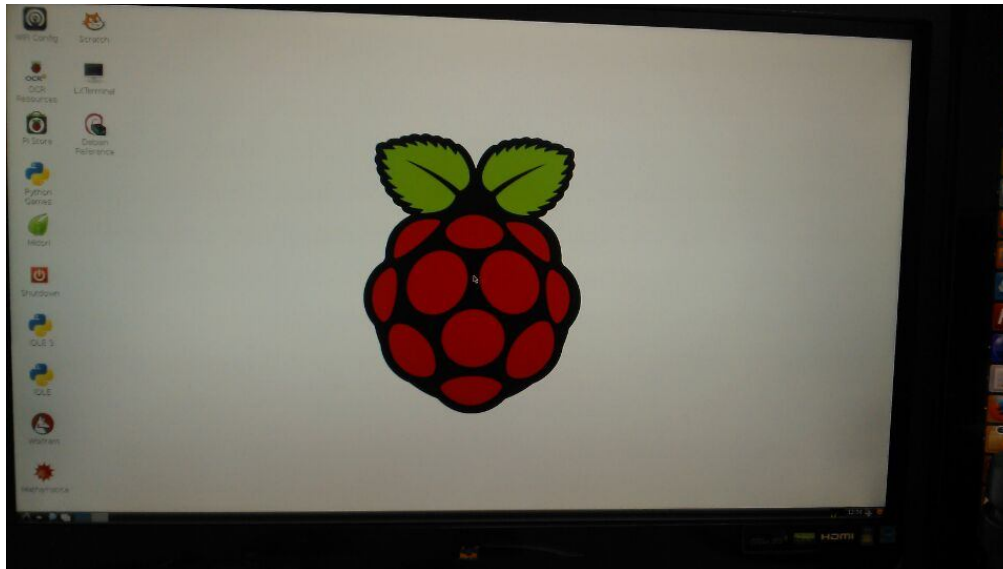
Ubuntu system screen



Debian system screen



Raspberry Pi



GPIO define

We can check Banana Pi PIN definition in this thread, including CON1, CON2, CON3, J11 and J12.

J11 contains the default serial port UART0 (UART0-RX,UART0-TX). UART0 is configured to be used for console input/output. Whilst this is useful if you want to login using the serial port. So it is the most common used PIN.

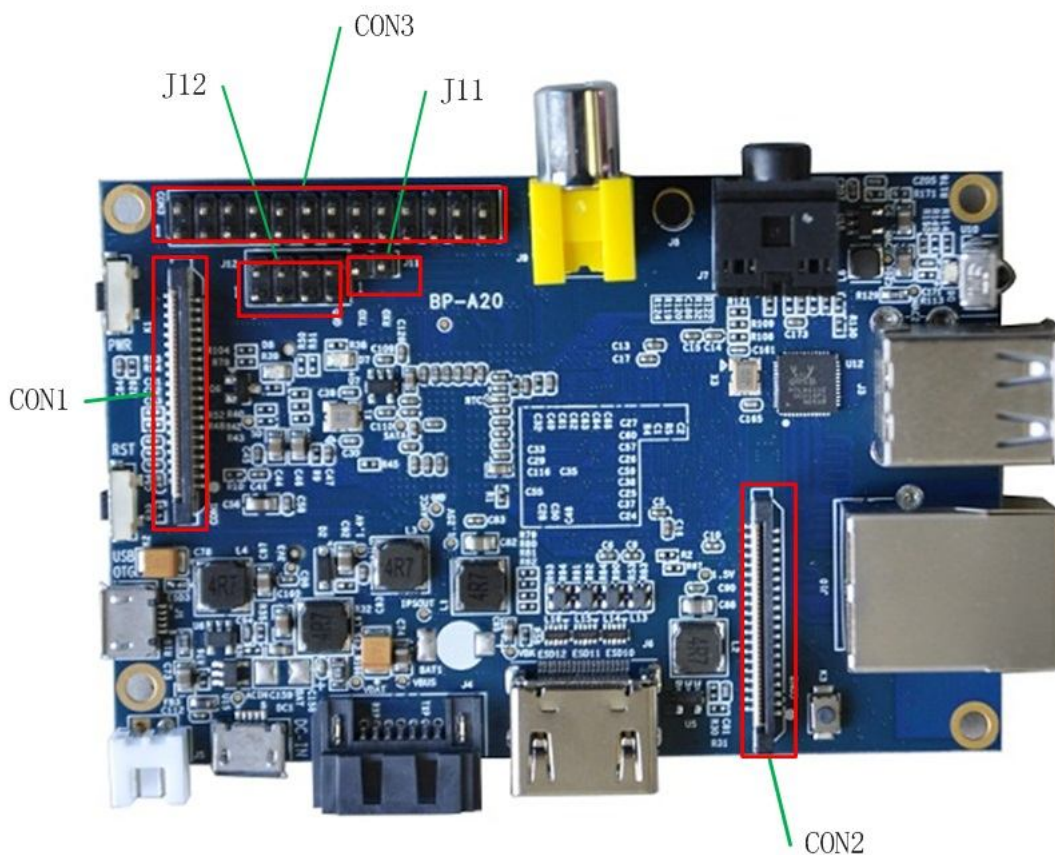
J12 also contains serial port.

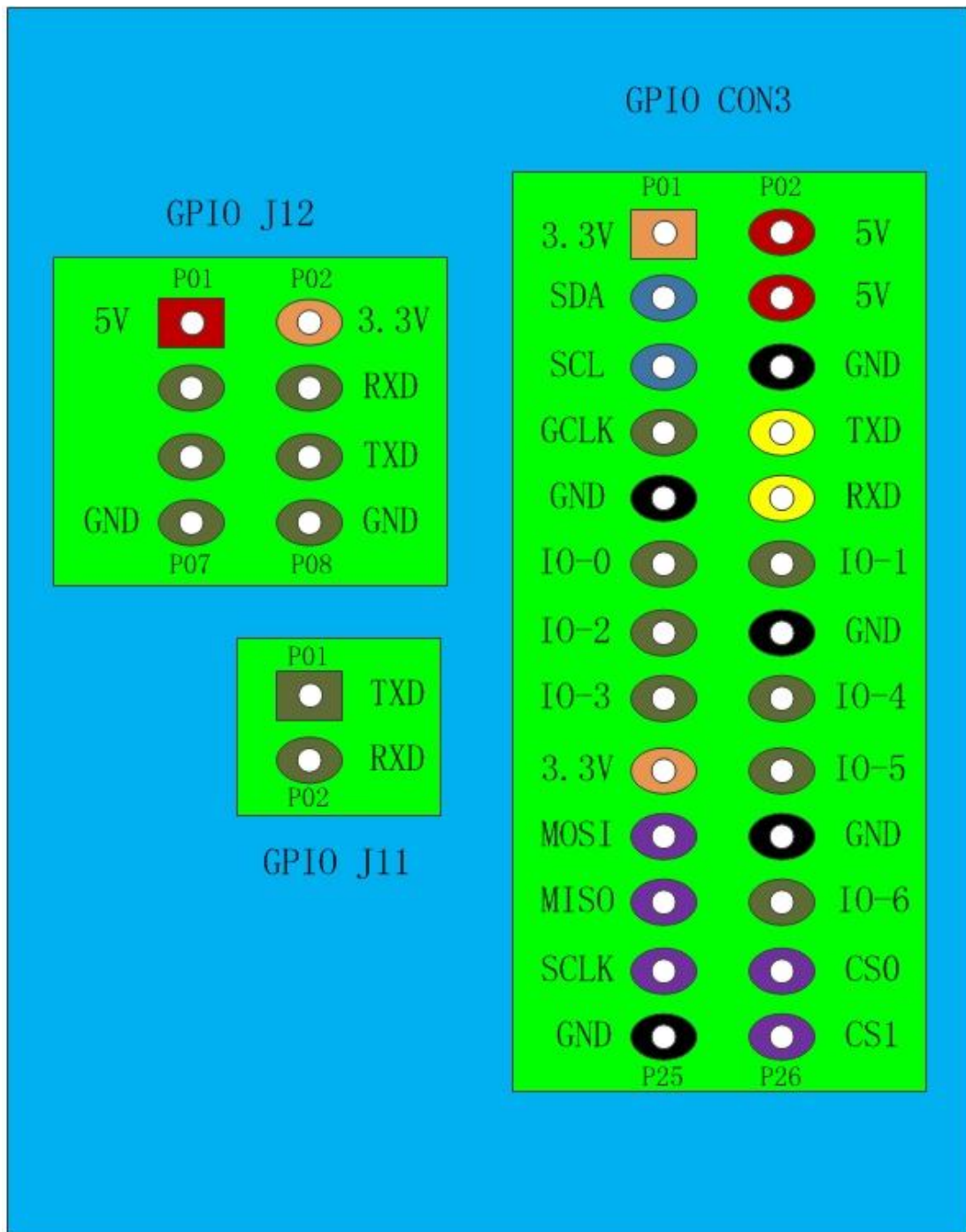
CON3 contains CAN bus, SPI bus, PWM, serial port and etc. It can be configured to be used for kinds of peripherals.

CON1 is a DSI display connector.

CON2 is a CSI camera connector.

Pictures and tables below show the specific layout and definition of PIN.





Banana Pi V1.4 PIN define

| PIN | PIN define | GPIO |
|----------|------------|------|
| CON1-P01 | LINEINL | |
| CON1-P02 | LINEINR | |

| | | |
|----------|--------------|------|
| CON1-P37 | HPL | |
| CON1-P36 | HPR | |
| CON1-P07 | FMINL | |
| CON1-P09 | FMINR | |
| CON1-P04 | ADC_X1 | |
| CON1-P06 | ADC_X2 | |
| CON1-P08 | ADC_Y1 | |
| CON1-P10 | ADC_Y2 | |
| CON1-P13 | LRADC0 | |
| CON1-P15 | LRADC1 | |
| CON1-P33 | RESET# | |
| CON1-P17 | CSI-D0 | PE4 |
| CON1-P19 | CSI-D1 | PE5 |
| CON1-P21 | CSI-D2 | PE6 |
| CON1-P23 | CSI-D3 | PE7 |
| CON1-P25 | CSI-D4 | PE8 |
| CON1-P27 | CSI-D5 | PE9 |
| CON1-P29 | CSI-D6 | PE10 |
| CON1-P31 | CSI-D7 | PE11 |
| CON1-P20 | CSI-PCLK | PE0 |
| CON1-P24 | CSI-MCLK | PE1 |
| CON1-P28 | CSI-VSYNC | PE3 |
| CON1-P30 | CSI-HSYNC | PE2 |
| CON1-P18 | CSI0-STBY-EN | PH19 |
| CON1-P26 | CSI0-RESET# | PH14 |
| CON1-P32 | CSI1-STBY-EN | PH18 |
| CON1-P34 | CSI1-RESET# | PH13 |
| CON1-P14 | TWI1-SDA | PB19 |
| CON1-P16 | TWI1-SCK | PB18 |
| CON1-P12 | CSI-FLASH | PH17 |
| CON1-P22 | CSI0-PWR-EN | PH16 |
| CON1-P35 | CSI-I00 | PH11 |
| CON1-P38 | IPSOUT | |
| CON1-P40 | IPSOUT | |
| CON1-P05 | GND | |
| CON1-P11 | GND | |
| CON1-P39 | GND | |
| CON1-P03 | VCC-CSI | |
| CON2-P09 | LCD0-D00 | PD0 |

| | | |
|----------|------------|------|
| CON2-P11 | LCD0-D01 | PD1 |
| CON2-P13 | LCD0-D02 | PD2 |
| CON2-P15 | LCD0-D03 | PD3 |
| CON2-P17 | LCD0-D04 | PD4 |
| CON2-P19 | LCD0-D05 | PD5 |
| CON2-P21 | LCD0-D06 | PD6 |
| CON2-P23 | LCD0-D07 | PD7 |
| CON2-P25 | LCD0-D08 | PD8 |
| CON2-P27 | LCD0-D09 | PD9 |
| CON2-P29 | LCD0-D10 | PD10 |
| CON2-P31 | LCD0-D11 | PD11 |
| CON2-P33 | LCD0-D12 | PD12 |
| CON2-P35 | LCD0-D13 | PD13 |
| CON2-P37 | LCD0-D14 | PD14 |
| CON2-P39 | LCD0-D15 | PD15 |
| CON2-P40 | LCD0-D16 | PD16 |
| CON2-P38 | LCD0-D17 | PD17 |
| CON2-P36 | LCD0-D18 | PD18 |
| CON2-P34 | LCD0-D19 | PD19 |
| CON2-P32 | LCD0-D20 | PD20 |
| CON2-P30 | LCD0-D21 | PD21 |
| CON2-P28 | LCD0-D22 | PD22 |
| CON2-P26 | LCD0-D23 | PD23 |
| CON2-P22 | LCD0-CLK | PD24 |
| CON2-P20 | LCD0-CS | PH6 |
| CON2-P18 | LCD0-HSYNC | PD26 |
| CON2-P16 | LCD0-VSYNC | PD27 |
| CON2-P14 | LCD0-DE | PD25 |
| CON2-P12 | LCD0-I02 | PH9 |
| CON2-P10 | PWM0 | PB2 |
| CON2-P08 | LCD0-I01 | PH8 |
| CON2-P06 | LCD0-I00 | PH7 |
| CON2-P04 | TWI3-SCK | PI0 |
| CON2-P02 | TWI3-SDA | PI1 |
| CON2-P07 | LCDIO-03 | PH12 |
| CON2-P01 | IPSOUT | |
| CON2-P03 | IPSOUT | |
| CON2-P05 | GND | |
| CON2-P24 | GND | |
| | | |

| | | |
|----------|-----------|------|
| CON3-P18 | CAN_RX | PH21 |
| CON3-P16 | CAN_TX | PH20 |
| CON3-P23 | SPI0_CLK | PI11 |
| CON3-P21 | SPI0_MISO | PI13 |
| CON3-P19 | SPI0_MOSI | PI12 |
| CON3-P24 | SPI0_CS0 | PI10 |
| CON3-P26 | SPI0_CS1 | PI14 |
| CON3-P05 | TWI2-SCK | PB20 |
| CON3-P03 | TWI2-SDA | PB21 |
| CON3-P15 | UART2_CTS | PI17 |
| CON3-P22 | UART2_RTS | PI16 |
| CON3-P11 | UART2_RX | PI19 |
| CON3-P13 | UART2_TX | PI18 |
| CON3-P10 | UART3_RX | PH1 |
| CON3-P08 | UART3_TX | PH0 |
| CON3-P12 | PH2 | PH2 |
| CON3-P07 | PWM1 | PI3 |
| CON3-P01 | VCC-3V3 | |
| CON3-P17 | VCC-3V3 | |
| CON3-P02 | VCC-5V | |
| CON3-P04 | VCC-5V | |
| CON3-P09 | GND | |
| CON3-P25 | GND | |
| CON3-P06 | GND | |
| CON3-P14 | GND | |
| CON3-P20 | GND | |
| | | |
| J12-P03 | PH5 | PH5 |
| J12-P05 | PH3 | PH3 |
| J12-P04 | UART7_RX | PI21 |
| J12-P06 | UART7_TX | PI20 |
| J12-P01 | VCC-5V | |
| J12-P02 | VCC-3V3 | |
| J12-P07 | GND | |
| J12-P08 | GND | |
| | | |
| J11-P01 | UART0-TX | PB22 |
| J11-P02 | UART0-RX | PB23 |

Banana pi UART define

