BPI-M2+（BPI-M2 Plus）H3 quad cord single board computer

bananapi

Published with GitBook

Table of Contents

About banana pi BPI-M2+ (M2 plus)

Banana PI BPI-M2+ is the open source hardware platform,Banana PI BPI-M2+ is an quad core version of Banana Pi,it support WIFI on board. use Alliwnner H3 chip on board. and mini size only 65mm*65mm

Banana Pi BPI-M2+ series run Android,Debian linux,Ubuntu linux, Raspberry Pi image and others image. Banana PI PBI-M2 hardware: 1Ghz ARM7 quad-core processor, 1GB DDR3 SDRAM, 8G eMMC flash on board,and SDIO wifi module on board.

Banana PI BPI-M2+ with Gigabit ethernet port, It can run with Android 4.4 smoothly. it can easily run with the game it support 1080P high definition video output and 4K support, the GPIO compatible with Raspberry Pi B+ and can support raspbian Image

Note:

- Banana Pi BPI-M2+ not support sata port, so you need use USB for hardisk
- Banana pi BPI-M2+ not support LCD interface.

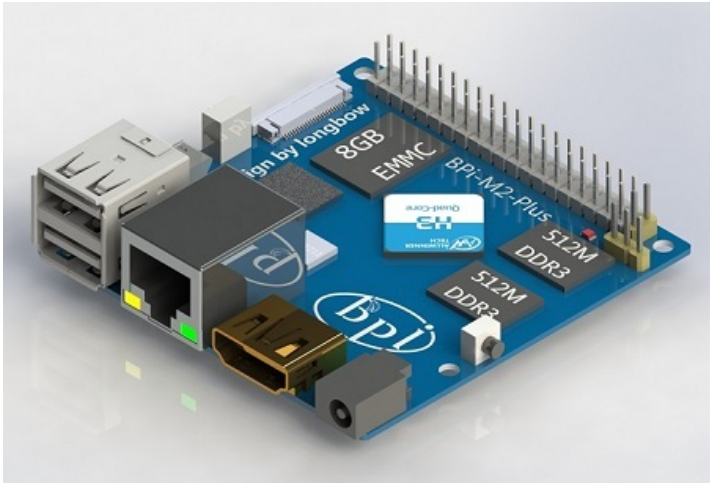
For cost down version ,we may remove 8G eMMC and on board wifi module. so ,everyone can free DIY on this board.

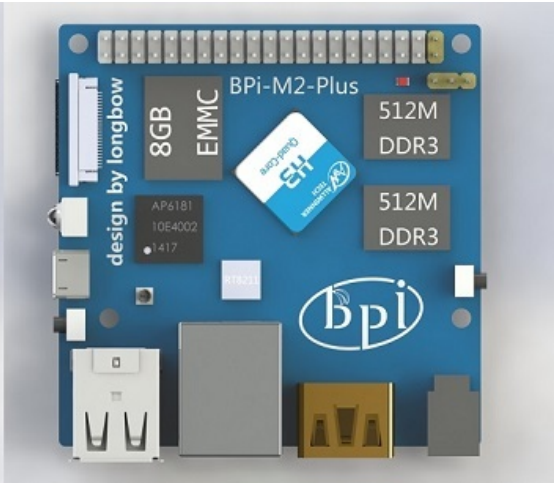
forum: http//www.banana-pi.org

forum: http://www.bananapi.com

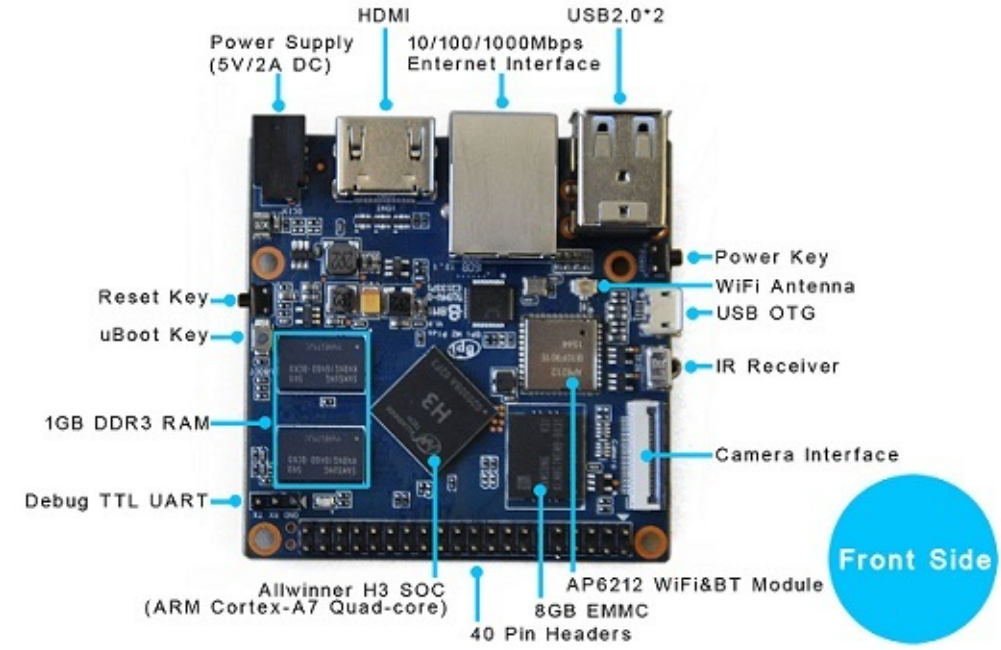
product: http://www.banana-pi.com

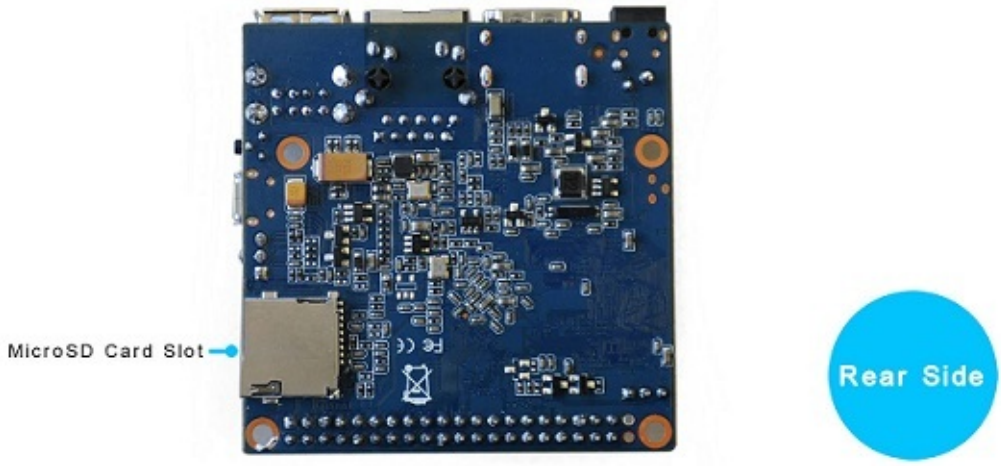
First Look BPI-M2+





BPI-M2+ hardware interface





BPI-M2+ (BPI-M2 plus) hardware spec

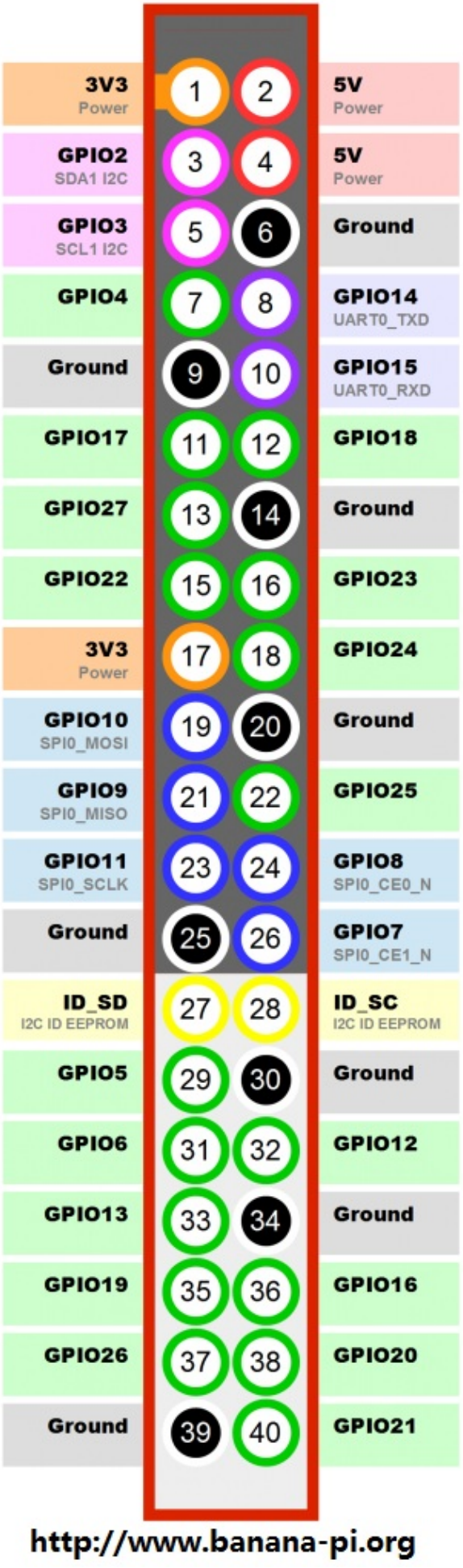
Hardware specification

CPU	H3 Quad-core Cortex-A7 H.265/HEVC 4K
GPU	Mali400MP2 GPU @600MHz,Supports OpenGL ES 2.0
Memory (SDRAM)	1GB DDR3 (shared with GPU)
Onboard Storage	TF card (Max. 64GB) / MMC card slot,up to 2T on 2.5 SATA disk, 8GB EMMC Flash
Onboard Network	10/100/1000M Ethernet RJ45
Onboard WIFI	SDIO AP6212（option AP6181、AP6335）
Video Input	A CSI input connector Camera:1 Supports 8-bit YUV422 CMOS sensor interface,2 Supports CCIR656 protocol for NTSC and PAL,3 Supports SM pixel camera sensor ,4 Supports video capture solution up to 1080p@30fps
Video Outputs	Supports HDMI output with HDCP,Supports HDMI CEC, Supports HDMI 30 function,Integrated CVBS, Supports simultaneous output of HDMI and CVBS
Audio Output	HDMI
Power Source	DC input can supply power, but USB OTG input don’t supply power
USB 2.0 Ports	two USB 2.0 HOST, one USB 2.0 OTG
Buttons	Power Button, Recovery Button, Uboot Button
Low-level peripherals	40 Pins Header,compatible with Raspberry Pi B+
uart GPIO(1x3) pin	UART, ground
LED	Power led & Status led
IR	IR input on board
Supported OS	Android, Ubuntu, Debian, Rasberry Pi Image
Product size	65mm × 65mm
Weight	48g

BPI-M2+ Pin define

Banana Pi BPI-M2+ 40-pin GPIO

Banana Pi BPI-M2+ has a 40-pin GPIO header that matches that of the Model B+ Raspberry Pi. Following is the Banana Pi GPIO Pinout:


3V3 Power
1
2
5V Power
GPIO2 SDA1 I2C
3
4
5V Power
GPIO3 SCL1 I2C
5
6
Ground
GPIO4
7
8
GPIO14 UART0_TXD
Ground
9
10
GPIO15 UART0_RXD
GPIO17
11
12
GPIO18
GPIO27
13
14
Ground
GPIO22
15
16
GPIO23
3V3 Power
17
18
GPIO24
GPIO10 SPI0_MOSI
19
20
Ground
GPIO9 SPI0_MISO
21
22
GPIO25
GPIO11 SPI0_SCLK
23
24
GPIO8 SPI0_CE0_N
Ground
25
26
GPIO7 SPI0_CE1_N
ID_SD I2C ID EEPROM
27
28
ID_SC I2C ID EEPROM
GPIO5
29
30
Ground
GPIO6
31
32
GPIO12
GPIO13
33
34
Ground
GPIO19
35
36
GPIO16
GPIO26
37
38
GPIO20
Ground
39
40
GPIO21
http://www.banana-pi.org

GPIO Pin Name	Default Function	Function2：GPIO	Function3
CON2-P01	VCC-3V3		
CON2-P02	VCC-5V		
CON2-P03	TWI0-SDA	PA12-EINT12	
CON2-P04	VCC-5V		
CON2-P05	TWI0-SCK	PA11-EINT11	
CON2-P06	GND		
CON2-P07	PWM1	PA6-EINT6	
CON2-P08	UART3-TX	PA13-EINT13	SPI1-CS
CON2-P09	GND		
CON2-P10	UART3-RX	PA14-EINT14	SPI1-CLK
CON2-P11	UART2-RX	PA1-EINT1	
CON2-P12	UART3-CTS	PA16-EINT16	SPI1-MISO
CON2-P13	UART2-TX	PA0-EINT0	
CON2-P14	GND		
CON2-P15	UART2-CTS	PA3-EINT3	
CON2-P16	UART3-RTS	PA15-EINT15	SPI1-MOSI
CON2-P17	VCC-3V3		
CON2-P18	PC4	PC4	
CON2-P19	SPI0-MOSI	PC0	
CON2-P20	GND		
CON2-P21	SPI0-MISO	PC1	
CON2-P22	UART2-RTS	PA2-EINT2	
CON2-P23	SPI0-CLK	PC2	
CON2-P24	SPI0-CS	PC3	
CON2-P25	GND		
CON2-P26	PC7	PC7	
CON2-P27	TWI1-SDA	PA19-EINT19	
CON2-P28	TWI1-SCK	PA18-EINT18	
CON2-P29	PA7-EINT7	PA7-EINT7	
CON2-P30	GND		

CON2-P31	PA8-EINT8	PA8-EINT8	
CON2-P32	PL2-S-EINT2	PL2-S-EINT2	
CON2-P33	PA9-EINT9	PA9-EINT9	
CON2-P34	GND		
CON2-P35	PA10-EINT10	PA10-EINT10	
CON2-P36	PL4-S-EINT4	PL4-S-EINT4	
CON2-P37	PA17-EINT17	PA17-EINT17	SPDIF-OUT
CON2-P38	PA21-EINT21	PA21-EINT21	
CON2-P39	GND		
CON2-P40	PA20-EINT20	PA20-EINT20	

CSI Camera Connector specification:

The CSI Camera Connector is a 24-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
CN3-P01	NC	
CN3-P02	GND	
CN3-P03	CSI0-SDA	PE13
CN3-P04	CSI0-AVDD	
CN3-P05	CSI0-SCK	PE12
CN3-P06	CSI0-Reset	PE14
CN3-P07	CSI0-VSYNC	PE3
CN3-P08	CSI0-PWDN	PE15
CN3-P09	CSI0-HSYNC	PE2
CN3-P10	CSI0-DVDD	
CN3-P11	CSI0-DOVDD	
CN3-P12	CSI0-D7	PE11
CN3-P13	CSI0-MCLK	PE1
CN3-P14	CSI0-D6	PE10
CN3-P15	GND	
CN3-P16	CSI0-D5	PE9
CN3-P17	CSI0-PCLK	PE0
CN3-P18	CSI0-D4	PE8
CN3-P19	CSI0-D0	PE4
CN3-P20	CSI0-D3	PE7
CN3-P21	CSI0-D1	PE5
CN3-P22	CSI0-D2	PE6
CN3-P23	GND	
CN3-P24	CSI0-DOVDD	

UART specification:

The jumper CON3 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.

CON3 Pin Name	Default Function	GPIO
CON3 P03	UART0-TXD	PA4
CON3 P02	UART0-RXD	PA5
CON3 P01	GND	

BPI-M2+ SD card slot

BPI-M2+ have support a TF card slot. you can burn image to TF card ,and use it boot BPI-M2+ same as raspberry pi.

BPI-M2+ GigE LAN

Banana PI BPI-M2+ with one Gigabit ethernet port,use RTL8211E chip on board.

BPI-M2+ eMMC flash

BPI-M2+ have support 8G eMMC flash on board by defaults.for customization user , we can add 4-64G emmc on board.

So, you can burn your image to eMMC flash and boot from eMMC flash.

How to burn Android image to eMMC

please read this book：

2.2.1 How to burn android image to eMMC

How to burn Linux image to eMMC

please read this book:

2.3.1 How to burn linux image to eMMC

Note:

the first boot is from microSD card. if you want to boot from eMMC flash ,please remove microSD card from BPI-M2+ microSD card slots.

BPI-M2+ WIFI interface

BPI-M2+ support AP6212 wifi module on board.used. it support 802.11/b/g/n wifi.

test report ,please see: 5.2 BPI-M2+ wifi Lab test

about AP6212 wifi&BT module spec:

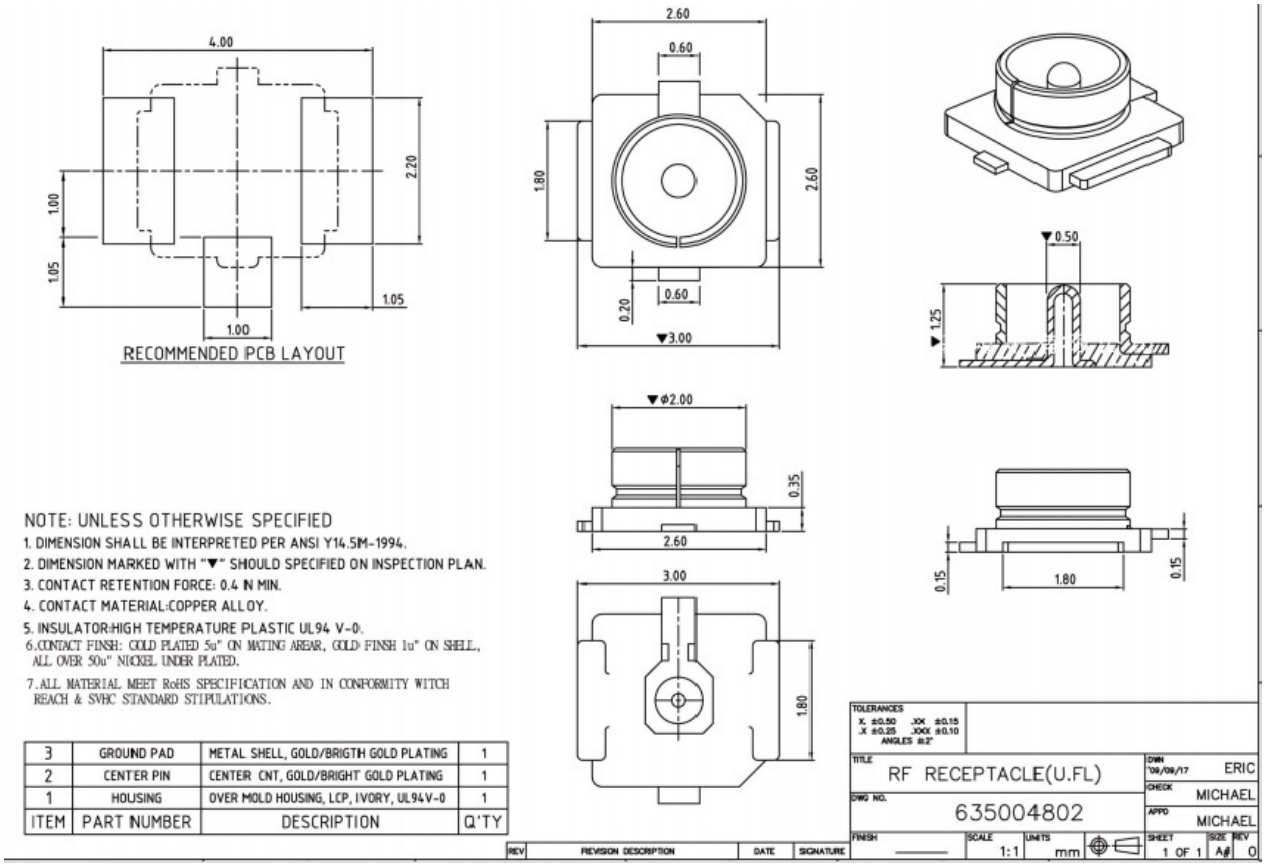
http://wiki.friendlyarm.com/wiki/images/5/57/AP6212_V1.1_09022014.pdf

BPI-M2+ wifi antenna slot

banana pi BPI-M2+ have support ap6212 wifi&BT module onboard

BPI-M2+ have wifi antenna slot on board

wifi extend antenna slot spec:



so you can use 3DB/5DB wifi antenna on BPI-M2+

BPI-M2+ bluetooth interface

BPI-M2+ have AP6212 WiFi&Bluetooth on baord.same as BPI-M3. it support bluetooth function by defaults.

BPI-M2+ IR interface

BPI-M2+ support IR interface on board. you can use it as remote control.

1,install lirc

```
apt-get install lirc
apt-get install evtest
```

2,edit /etc/lirc/hardware.conf as below:

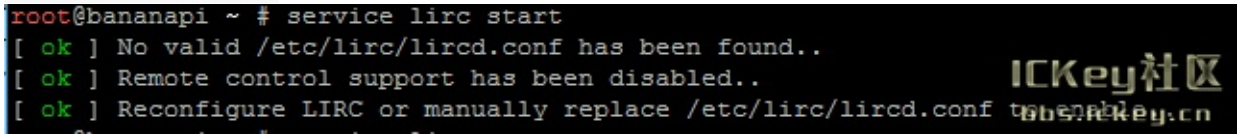
`nano /etc/lirc/hardware.conf`

```
# /etc/lirc/hardware.conf
#
# Arguments which will be used when launching lircd
LIRCD_ARGS="--uinput"
#Don't start lircmd even if there seems to be a good config file
#START_LIRCMD=false

#Don't start irexec, even if a good config file seems to exist.
#START_IREXEC=false

#Try to load appropriate kernel modules
LOAD_MODULES=true

# Run "lircd --driver=help" for a list of supported drivers.
DRIVER="UNCONFIGURED"
# usually /dev/lirc0 is the correct setting for systems using udev
DEVICE="/dev/input/event0"
MODULES="sunxi-ir"
```

ctrl+O save and ctrl+x exit.

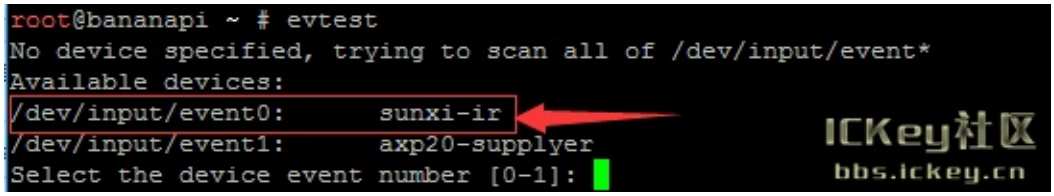
3,test lirc

`service lirc start`

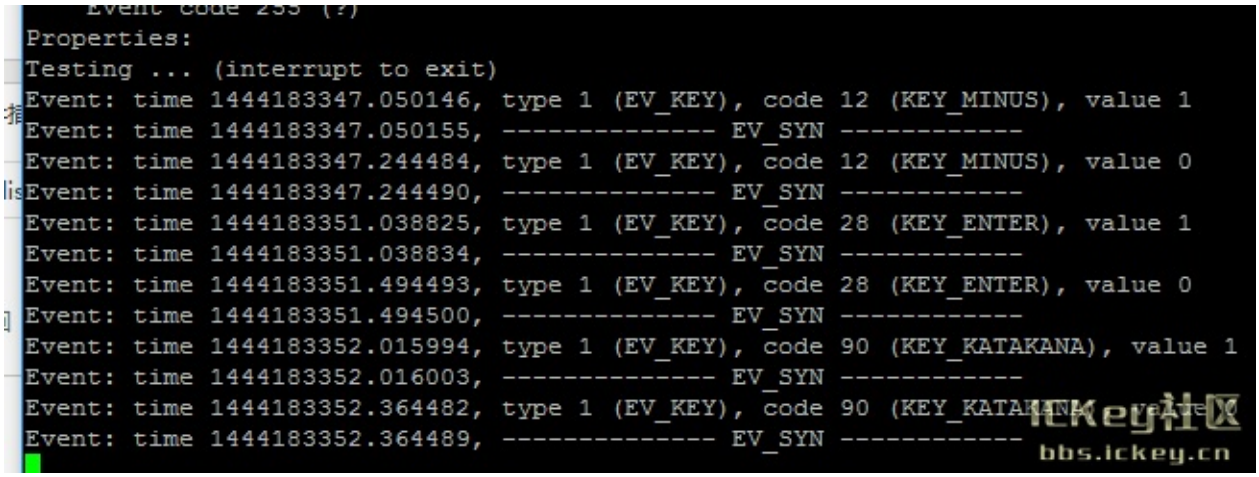


4 test remote-control unit

`evtest`



choose "0" must xunxi-ir



please note:value 0 value 1

press is:1，unpress is:0

key 64	MOUSE	WAKE
key 24	BACK	WAKE_DROPPED
key 83	VOLUME_DOWN	WAKE
key 91	VOLUME_UP	WAKE

BPI-M2+ keycode:

IR Address: 4040

1.how to do check IR address on Android.

```
echo 0xff > /sys/module/sunxi_ir_rx/parameters

<7>[  625.998452] IR code = 0xf20d4040
<7>[  625.998473] IR RAW CODE : 13
<7>[  625.998542] IR CODE : 13
<7>[  625.998629] IR KEY VALE 13
<7>[  625.998653] ir_rx_irq_service: Rx Packet End, code=0xf20d4040, ir_code=0x
<6>[  625.998717] cpus_wakeup_config_handler: address: 0x4040, powerkey: 0x0a
<6>[  626.002717] cpus_wakeup_config_handler: ok
```

demo IR remote control on youtube:

https://www.youtube.com/watch?v=HhW_G85Byio&feature=youtu.be

BPI IR remoter control accessoires:

https://bananapi.gitbooks.io/bpi-accessories/content/irremotecontrol.html

BPI-M2+ HDMI interfact

BPI-M3 has a standard HDMI 1.4 interface. so We can use HDMI-to-HDMI cable to connect BPI-M3 to the display monitor that has HDMI interface.

But If the display monitor doesn't have HDMI interface,only VGA or DVI port. We should use HDMI-to-VGA or HDMI-to-DVI cable to connect the BPI-M3 to the display monitor.

Note: if the HDMI-to-VGA/DVI cable is a bad quality cable,it will go wrong on the monitor display. please choose a good quality cable for BPI-M3

BPI-M2+ USB interface

BPI-M2+ have two USB 2.0 interface on board.so you can connect Keyboard,mouse, USB camera and ... on BPI-M2+.

two USB connect to H3 chip ,not use USB hub function ,so is support 480M speed for each port.

BPI-M2+ OTG interface

banana pi BPI-M3 have 1 OTG port on board.

BPI-M2+ OTG port also can power BPI-M2+, just use 5V/2A micro USB interface adapter.

so ,you can use DC port or OTG port to power BPI-M2+

BPI-M2+ CSI camera interface

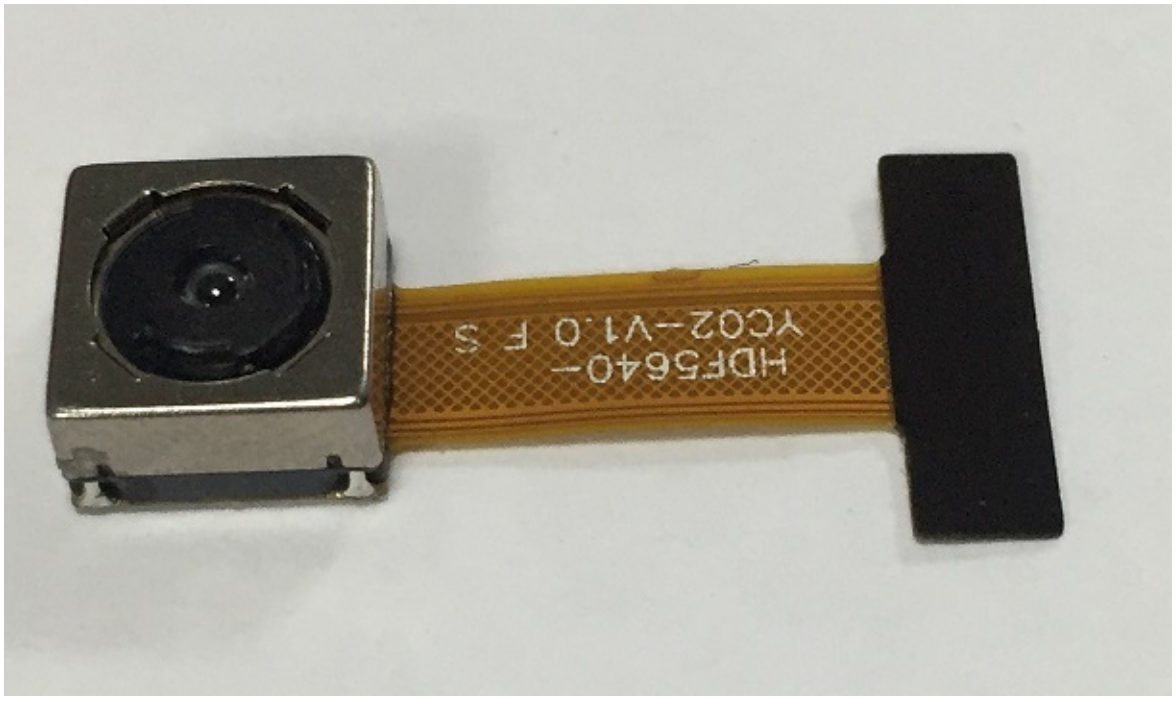
connect external camera module with proper signal pin mappings. The pin definitions of the CSI interface are shown as below. This is marked on the Banana Pi board as “CSI″.

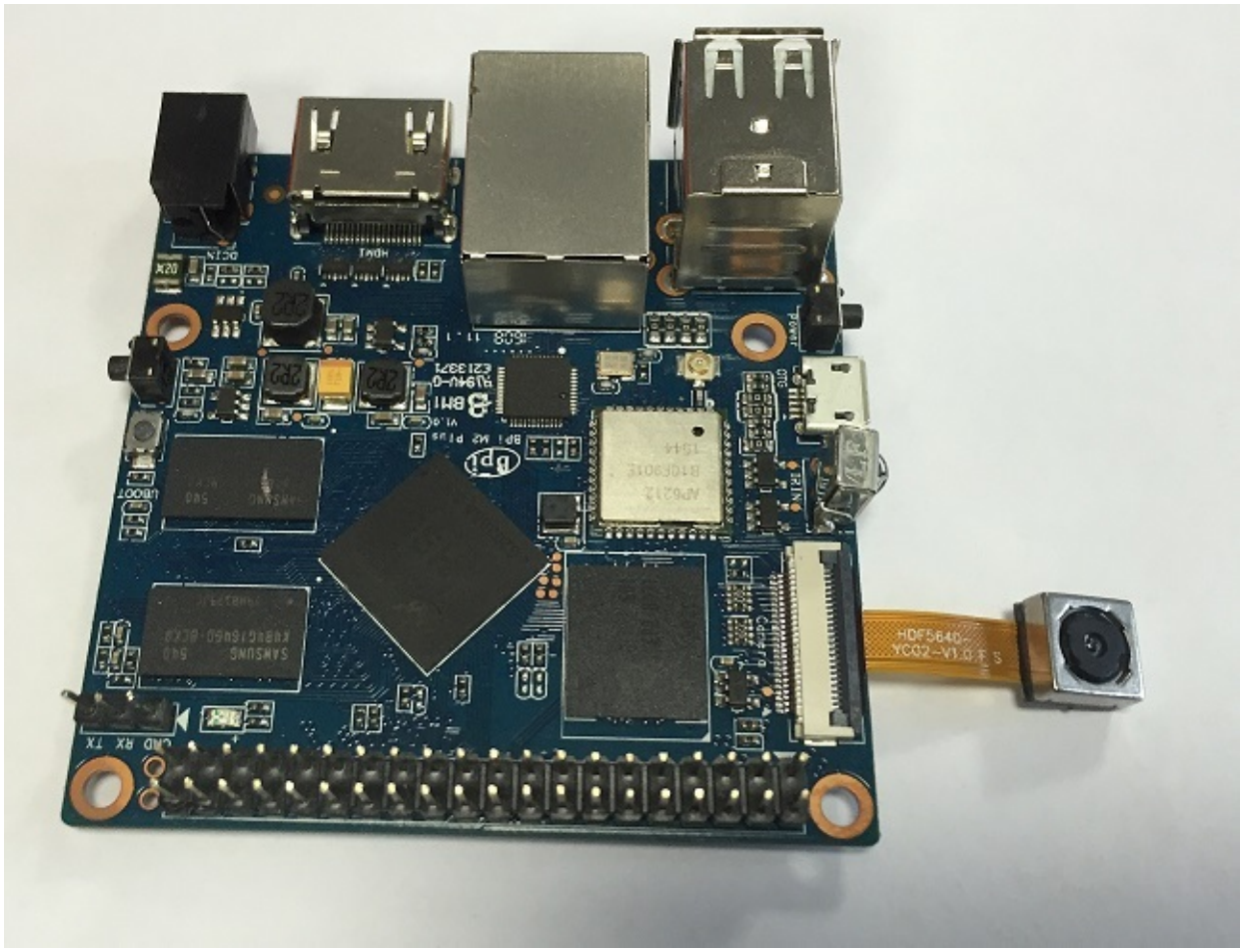
CSI pin define:

please see: BPI-M2+ GPIO pine define

BPI-M2+ CSI camera accessories

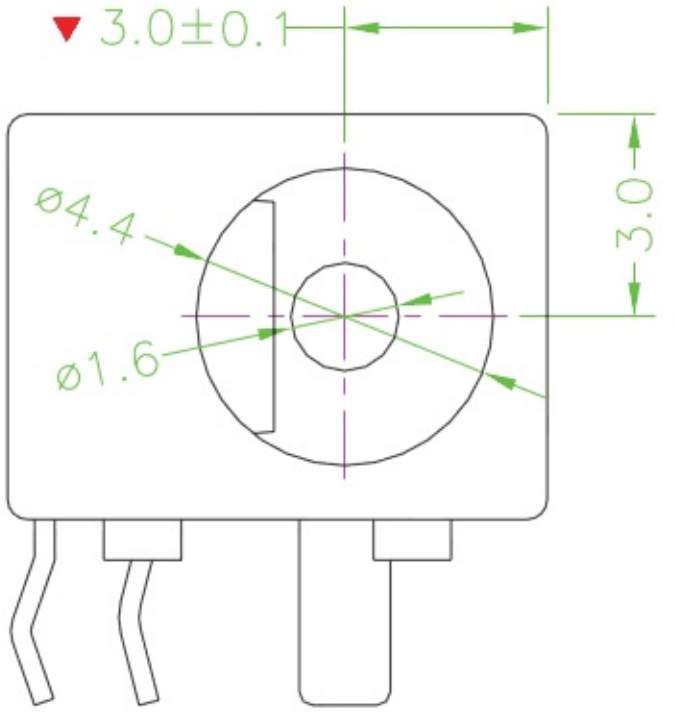
note: for BPI-M2+ , camera is not same as BPI-M2,BPI-M1.... , it support OV5640 module, not need extend board. you just can direct use OV5640 modue on CSI interface.




HDF5640
YC02-V1.0

BPI-M2+ Power interface

BPI-M2+ power with DC port， please use 5V/2A adapter for it.

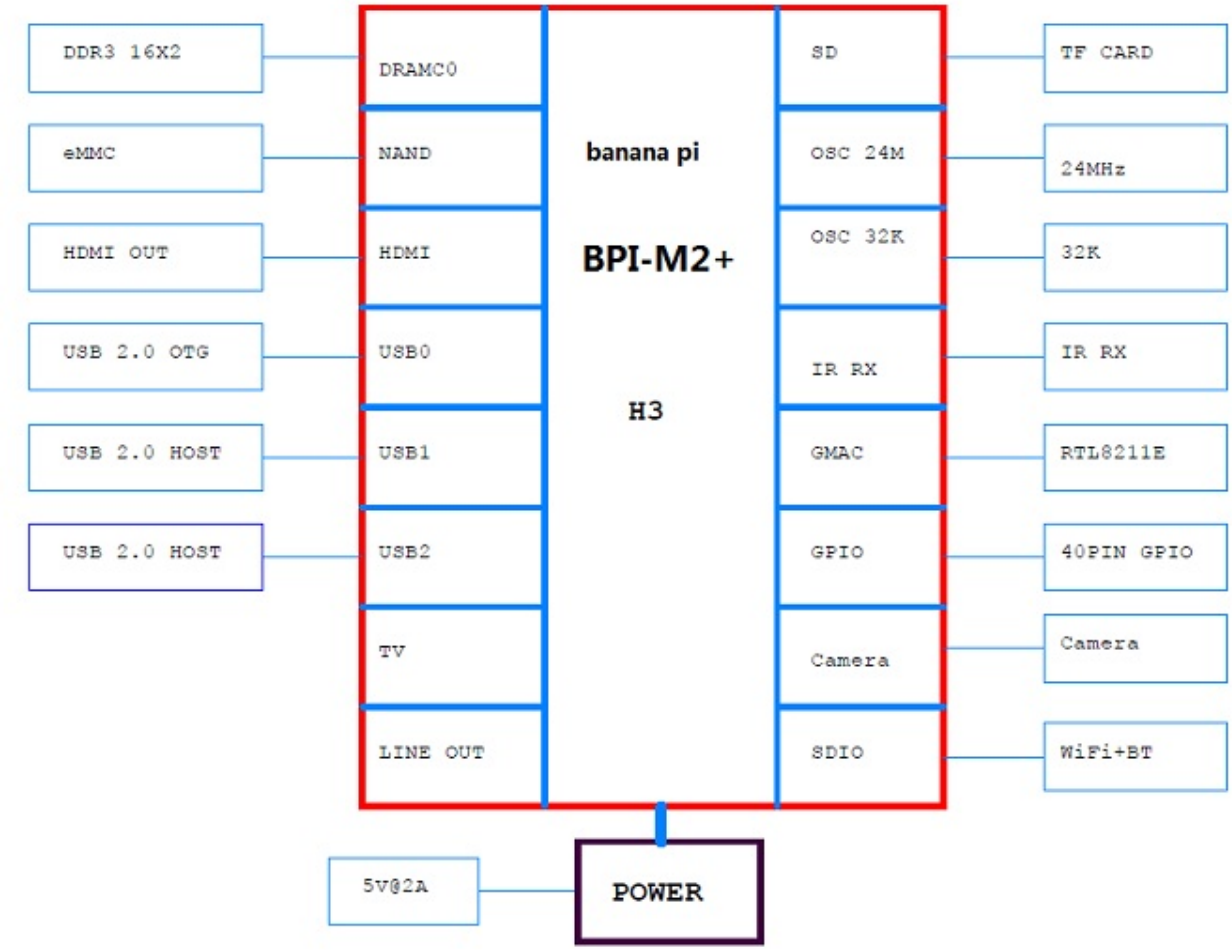


you can use same adapter with BPi-M2,BPI-M2+,BPI-M3.

BPI-M2+ OTG port also can power BPI-M2+, just use 5V/2A micro USB interface adapter.

so ,you can use DC port or OTG port to power BPI-M2+

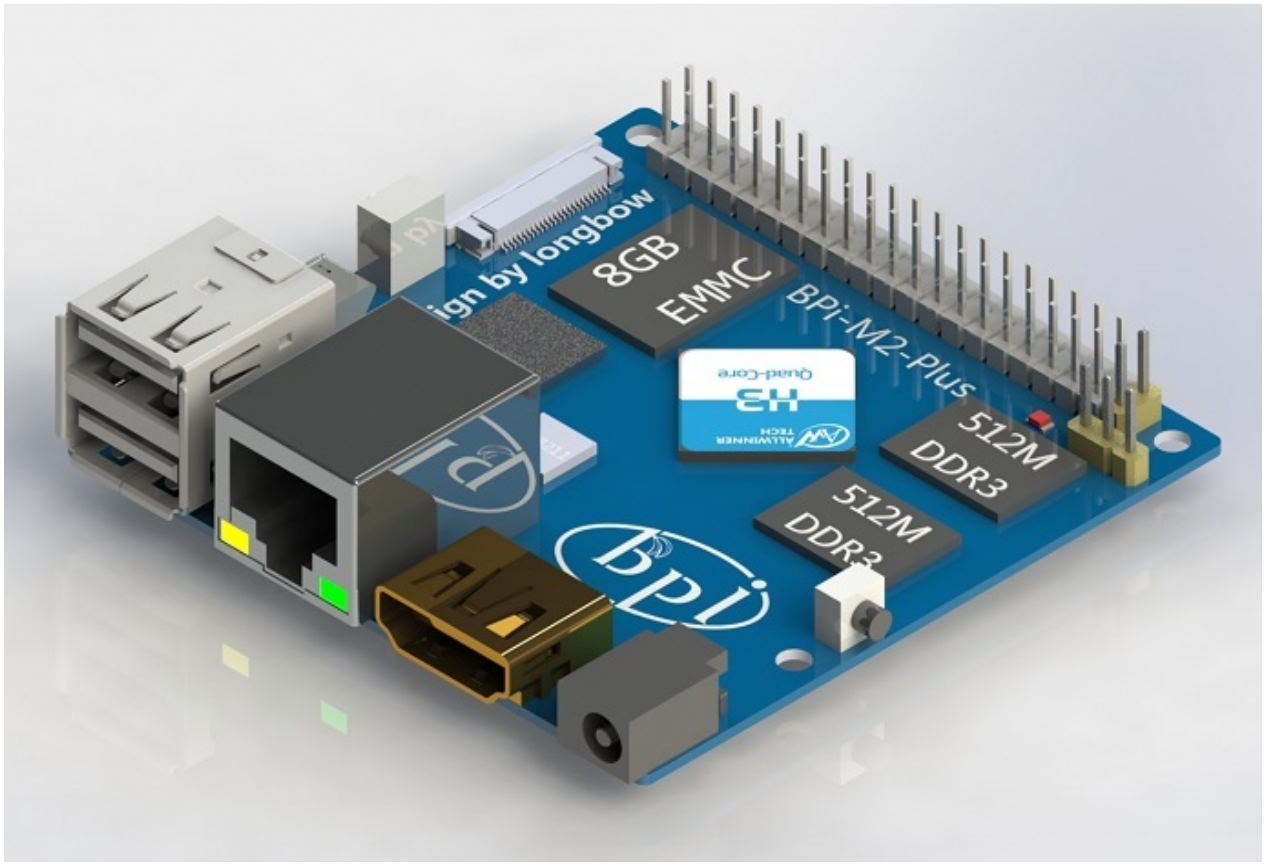
BPI-M2+ schematic diagram



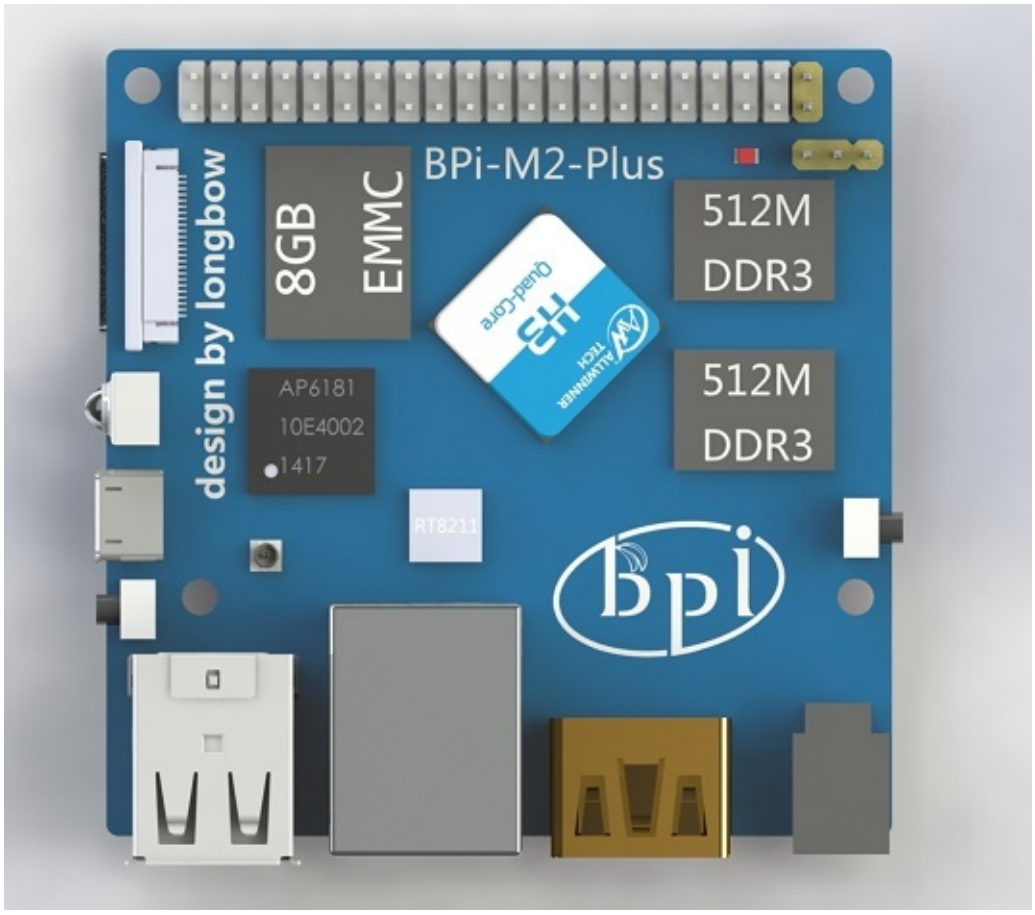
BPI-M2+ schematic diagram download link:

https://drive.google.com/file/d/0B4PAo2nW2KfnWElwRWhwZFhCdWc/view?usp=sharing

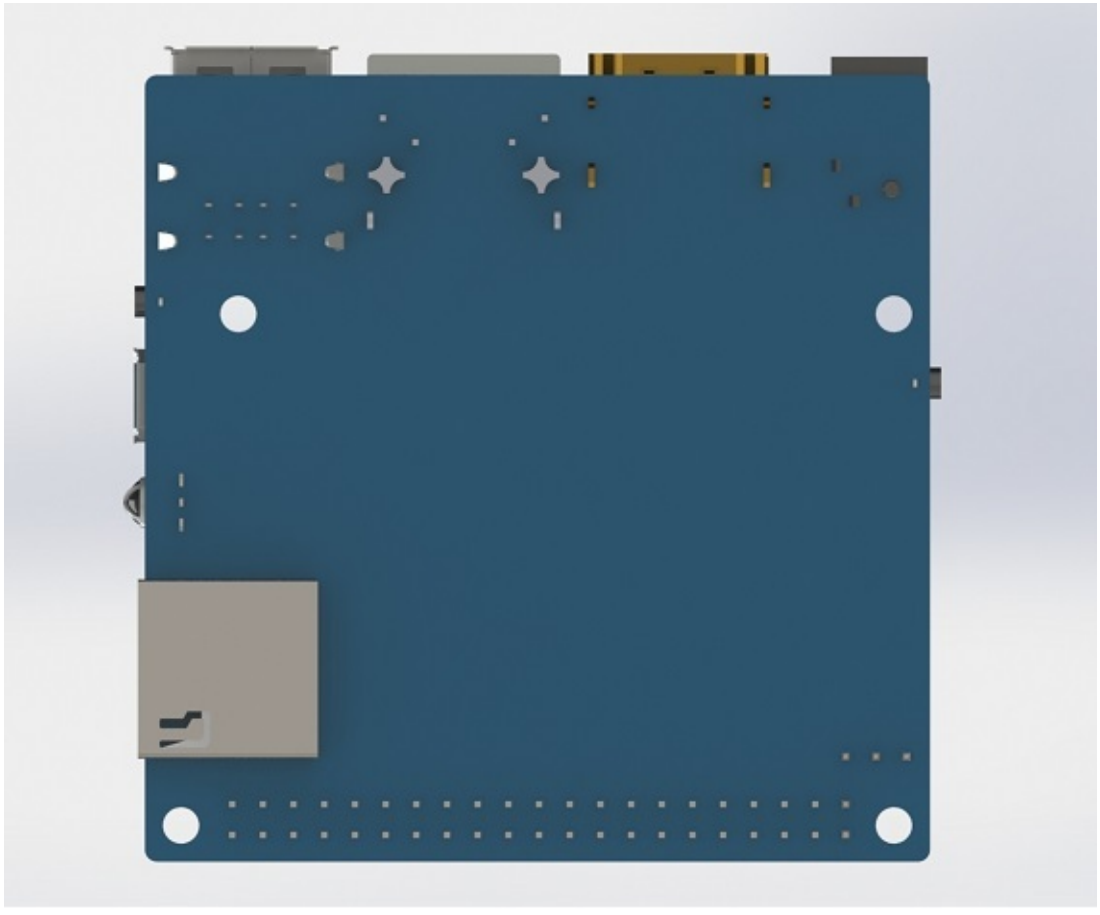
BPI-M2+ DXF and 3D design



3D design front:



3D design back:



BPI-M2+ DXF file download link:

https://drive.google.com/file/d/0B4PAo2nW2KfnaDRVLUpvV3hIVUk/view?usp=sharing

BPI-M2 3D design file download link:

https://drive.google.com/file/d/0B4PAo2nW2KfnVV8zaDhYazRvOU0/view?usp=sharing

note: wifi module is AP6212, not AP6181

BPI-M2+ software

BPI-M2+ Quick Start

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	MicroSD card	SD card is optional. If need to boot form SD card, Minimum size 8GB, class 10 (the class indicates how fast the card is). We recommend using branded SD cards as they are more reliable.
2	avHDMI(Full sized) to HDMI / DVI lead	HDMI to HDMI lead (for HD TVs and monitors with HDMI input).OR HDMI to DVI lead (for monitors with DVI input).
3	Keyboard and mouse	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	Networking is optional, although it makes updating and getting new software for your Banana Pi much easier.
5	Micro USB power adapter	A good quality, USB Power supply that can provide at least 5V/2A is essential.OTG also can power the board, but it is not recommended.
6	Audio lead (Optional)	You can choose a 3.5mm jack audio led to connect to audio port to get stereo audio.
7	Mobile Hard disk (Optional)	You can choose to connect a mobile hard disk to USB port to store more files.

Base you need below:

Step 2: Download the relevant Image file:

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

Step3: Prepare your SD card for the Banana Pi

In order to enjoy your Banana Pi BPI-M3, you will need to install an Operating System (OS) onto an SD card or eMMC Flash. Instructions below will teach you how to write an OS image to your SD card or eMMC Flash 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 8GB or greater.

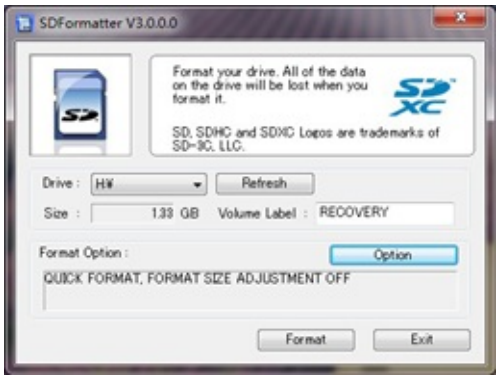
2.Format the SD card.

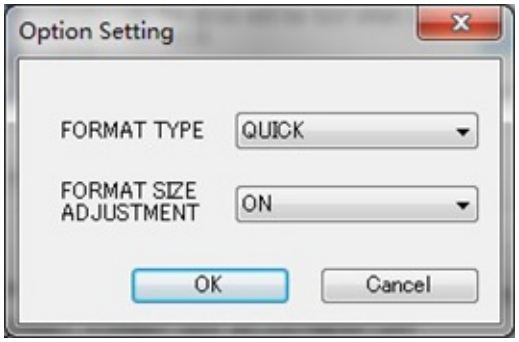
Format your SD under Windows os :

Download the a SD card format tool such as SD Formatter from https://www.sdcard.org/downloads/formatter_4/eula_windows/

*Unzip the download file and run the setup.exe to install the tool on your machine.

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





*Check that the SD card you inserted matches the one selected by the Tool.

*Click the “Format” button.

Format your SD under Linux os :

*Run fdisk –l command to check the SD card node.

*Run sudo fdisk /dev/sdx command to delete all partition of SD card.

*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(http://www.banana-pi.org)

4.Unzip the download file to get the OS image.

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

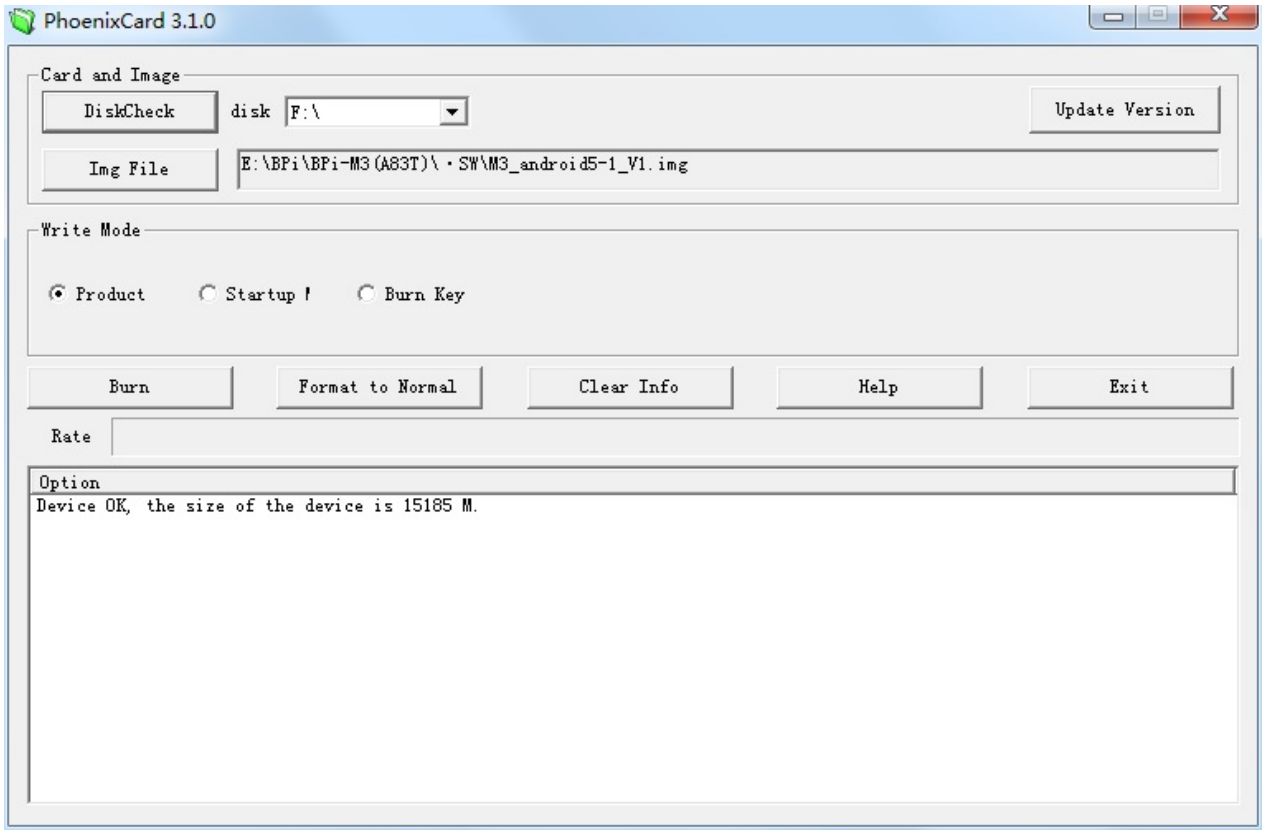
Linux: Run unzip [downloaded filename] command.

5.Write the image file to the SD card.

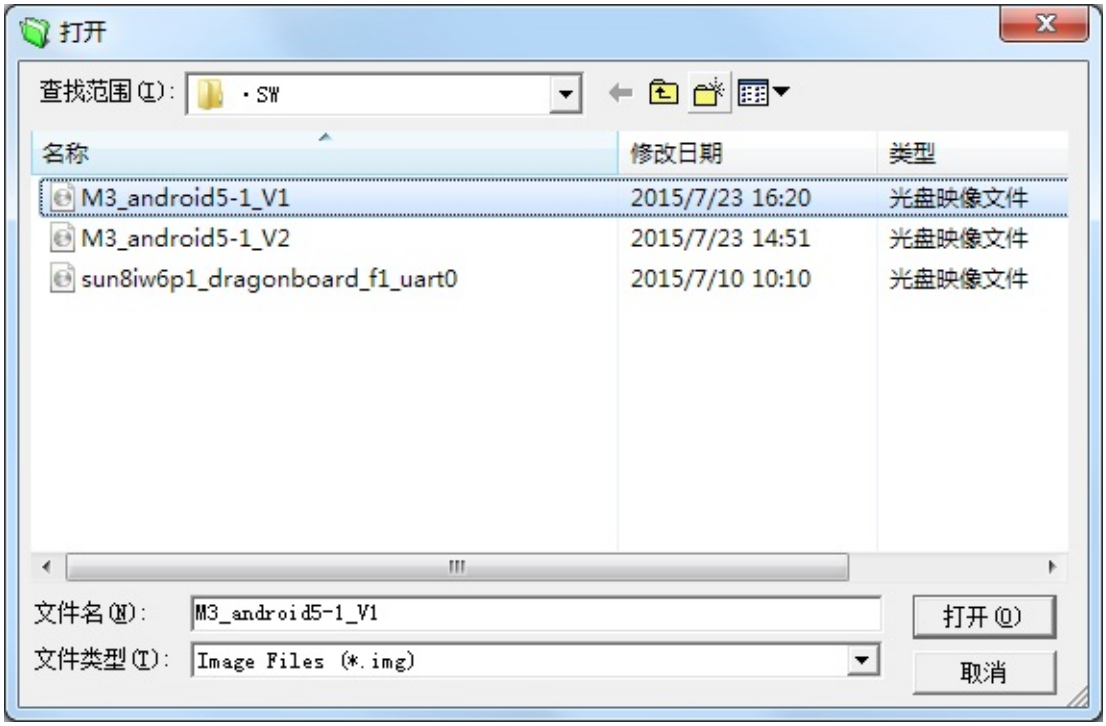
Android image

5.1 You need to use Phoenix Card to make the SD card. Download the Phoenix Card from https://drive.google.com/open?id=0BzoTh3Vdt47ffi1Id0RuWXhUVzdYdjFjaHEtMlNQWVFTRmIxcC1OQnczSTV6OGRZWGplNU0

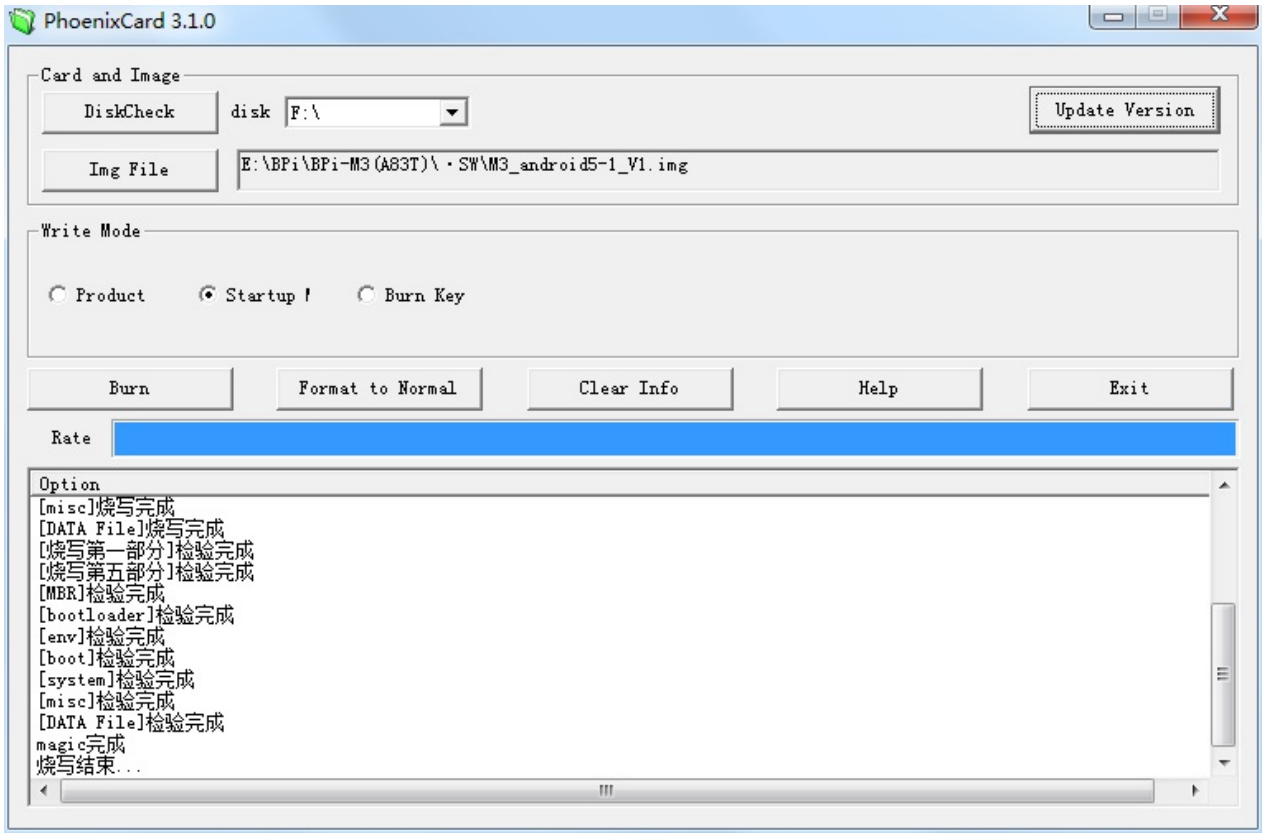
5.2 Run PhoenixCard.exe, Press “Disk Check” and select disk of SD Card.



5.3 Press “Image File” and Select system.img.



5.4 Press “Burn” to start upgrading, Upgraded complete, Press “Exit”.

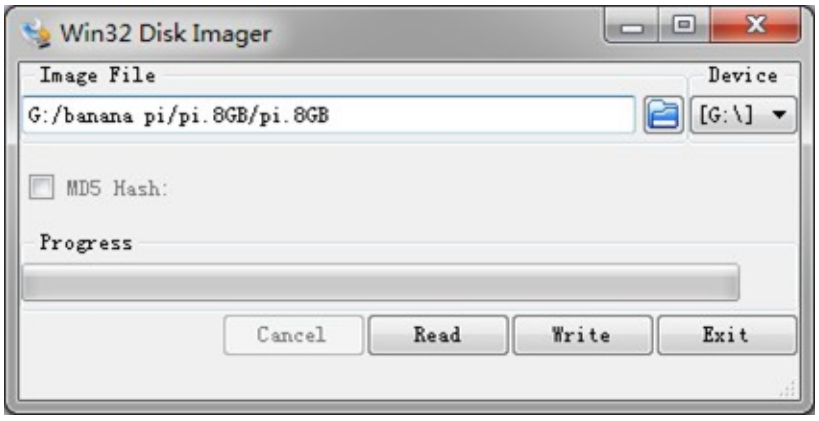


Linux image:

5.6 burun Linux image under Windows os:

*Download a tool that can wirte image to SD card, such as Win32 Diskimager from: http://sourceforge.net/projects/win32diskimager/files/Archive/

*Open the unzipped image file



*Click Write button. Wait patiently to successfully complete writing.

5.7 burun Linux image under Linux os:

*Run fdisk –l command to check the SD card node.

*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 M2+

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. 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.
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. 5.Finally, at the very left of the bottom edge is the USB power connector. Plug in a regulated power supply that is rated at 5V ±5% / 2000mA (or 2A). Any number bigger than 700 mA 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!

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 ,so you can use banana pi M2+ now.

Android software

Android 4.4 2016-04-11 for BPI-M2+

1. Android 4.4
2. HDMI 4K & 1080P & 720P(default) supported
3. GMAC supported
4. WIFI 802.11 b/g/n supported
5. Bluetooth 4.0 supported
6. IR supported
7. Camera ov5640 supported
8. USB Camera supported
9. adb root supported
10. adb tcp supported
11. preinstall Kodi V16 APP

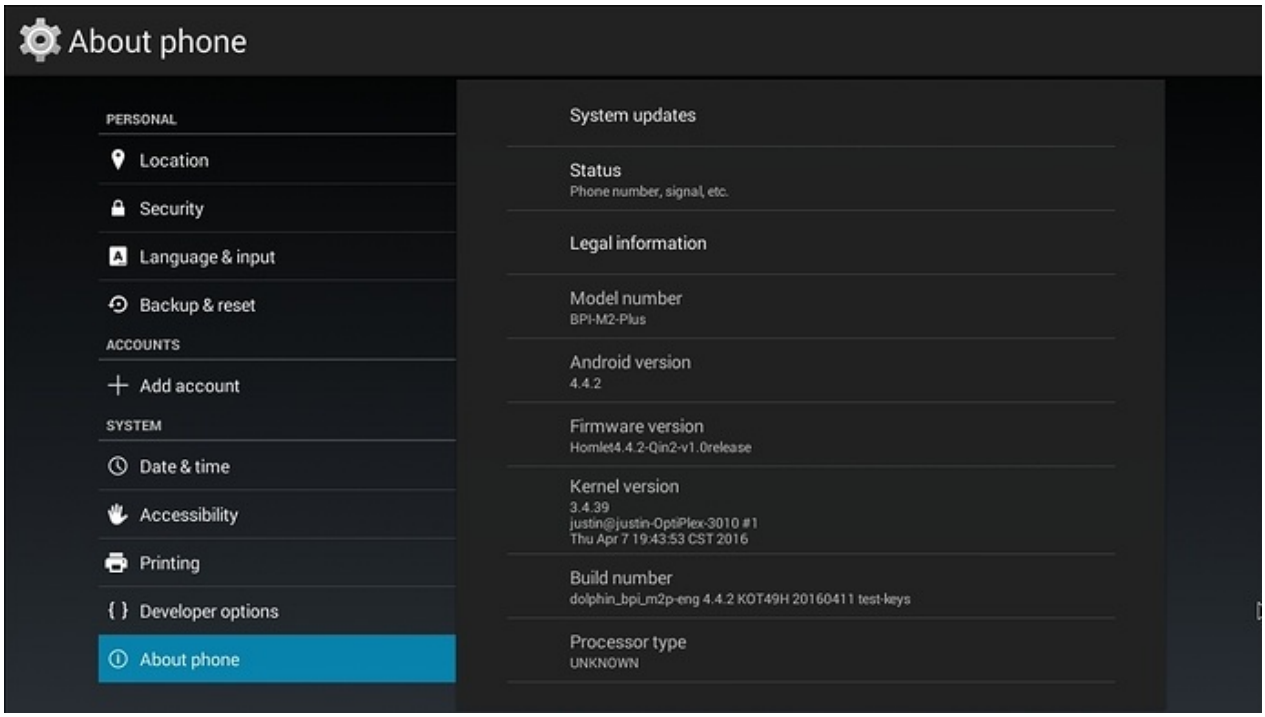
Google Drive:

https://drive.google.com/file/d/0B_YnvHgh2rwjaTdEdENEYnE2UXc/view

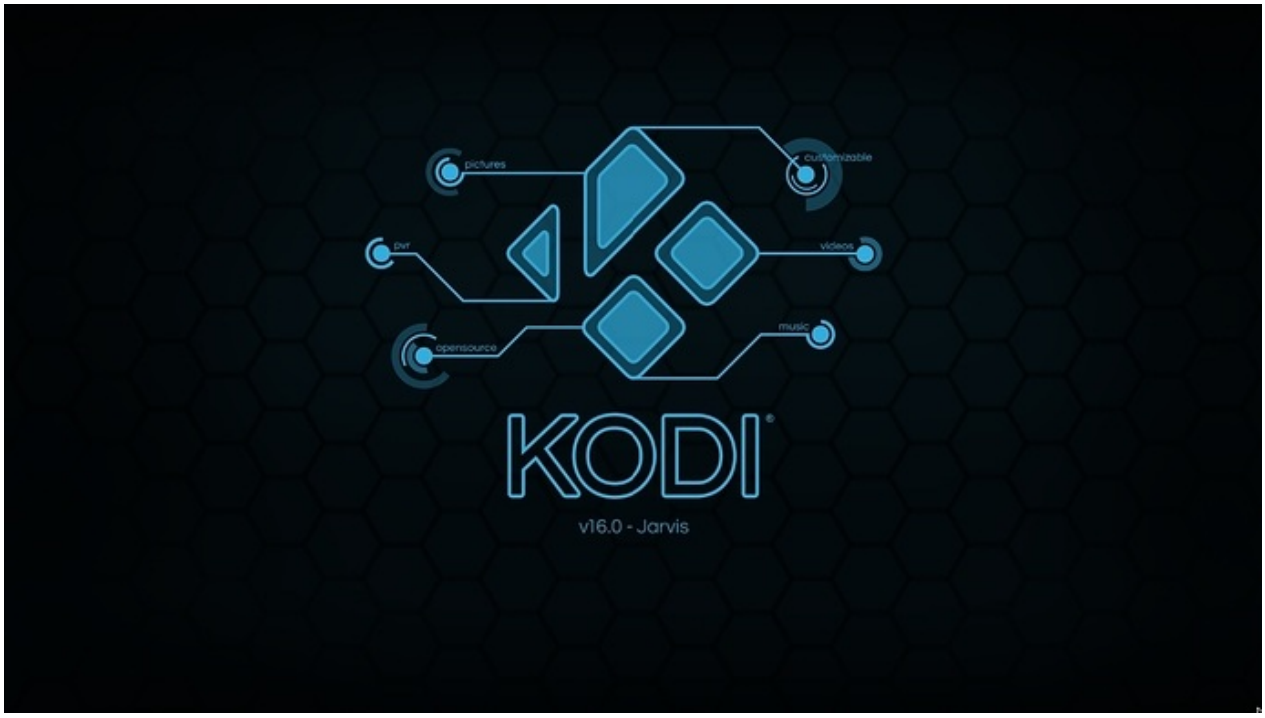
Baidu Cloud:

http://pan.baidu.com/s/1kUC9eGv

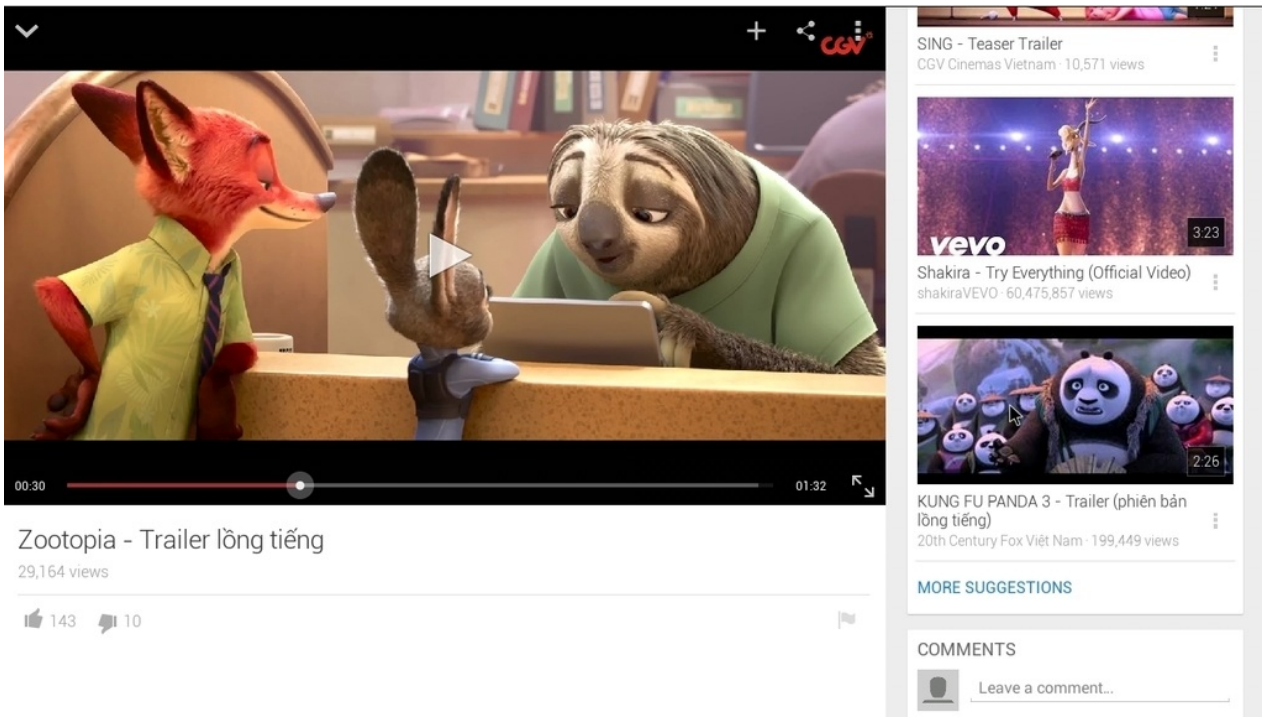
MD5: 10e277ca15d74bcfe7ff710a2f29fbf4



kodi support:



video play:



BPI-M2+ support android 4.4.2 image.

Realese note:

1. Android 4.4
2. HDMI 4K & 1080P & 720P(default) supported
3. GMAC supported
4. WIFI 802.11 b/g/n supported

5. Bluetooth 4.0 supported
6. IR supported
7. Camera ov5640 supported
8. USB Camera supported
9. adb root supported
10. adb tcp supported
11. preinstall Kodi V16 APP

Google Drive:

https://drive.google.com/file/d/0B_YnvHgh2rwjaTdEdENEYnE2UXc/view

Baidu Cloud:

http://pan.baidu.com/s/1kUC9eGv

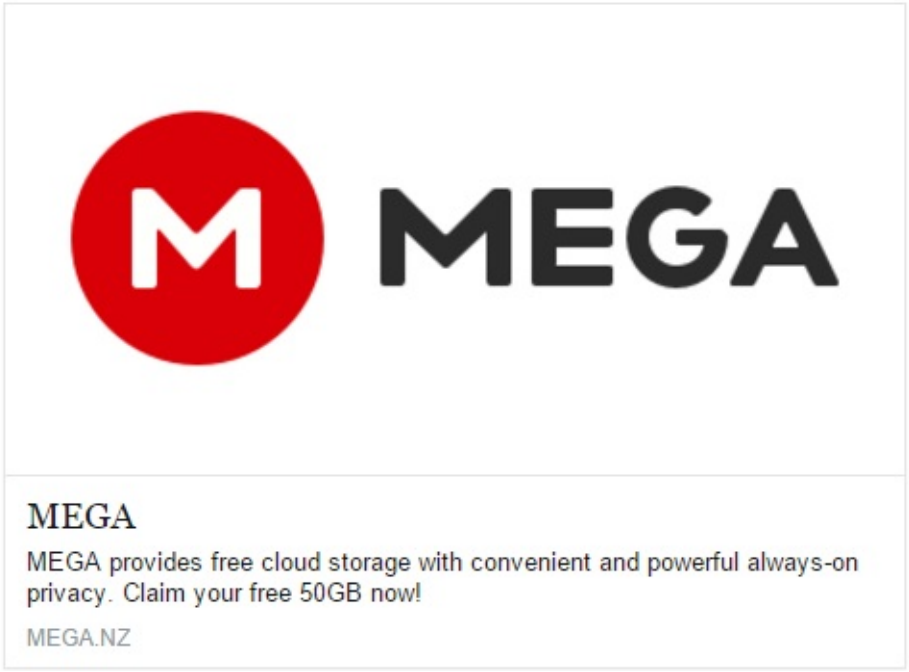
MD5: 10e277ca15d74bcfe7ff710a2f29fbf4

video demo on youtube:

https://www.youtube.com/watch?v=X61rDTGeFXY

[BPI-M2+] New image: Android MEGA version

Android image for m2+ ,working ethernet,wifi,bt,but only botom usb,very fast on emmc



download link:

https://mega.nz/#!lE0SiQpQ!SYbiTpFrcXlnvI4Wa_oJzCfUmKcdD2XftFdO-Agoth8

How to burn android image to eMMC under windows

1,download BPI-M2+ android image from http://www.banana-pi.org download page.

2,if your PC is windows OS, please download PhoenixSuit.zip tooling to burn if your PC is Linux OS, please download Linux 32bit or Linux 64bit tooling

example: burn android image to EMMC on windows.

1,install PhonenixSuit.

2,running PhonenixSuit. chick "one key to burn" choose your android image file.

3,press on BPI-M2+ uboot key. and plug in micro USB data line.

4，press on Power key to boot BPI-M2+.

5，press Yes to burn image:

6,if all is ok , try to boot from eMMC , if not success ,just need try again.

How to burn android image to eMMC under Linux

1,download android image from http://www.banan-pi.org download page.

2,download Linux 32bit or Linux 64bit tooling

3,Ubuntu OS run LiveSuit_For_Linux32(or 64) Directory LiveSuit.run

```
sudo ./LiveSuit.run
```

if prompt message missing dkms module,please install it：

```
sudo apt-get install dkms
```

```
sudo ./LiveSuit.run
```

4，install drivers:

```
sudo dpkg -i awdev-dkms_0.4_all.deb
```

5,when finished ,reboot system

6,Ubuntu system add udev rules:

```
sudo vim /etc/udev/rules.d/10-local.rules
```

7 input udev rules:

note: please replace GROUP="text" text with your user group.

```
    SUBSYSTEM!="usb_device", ACTION!="add", GOTO="objdev_rules_end"
    #USBasp
    ATTRS{idVendor}=="1f3a", ATTRS{idProduct}=="efe8", GROUP="text",
    MODE="0666"
    LABEL="objdev_rules_end"
```

save & reboot or just reboot udev server, so you can run LiveSuit.sh as a general user,reboot udev commond :

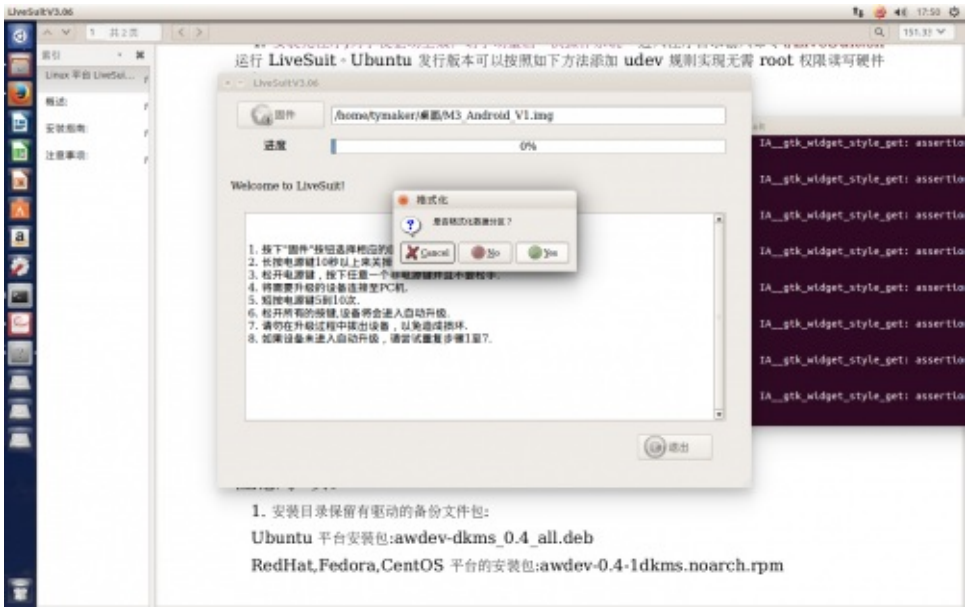
```
sudo service udev restart
```

8 run burn tooling(home/usernamer/Bin)

```
./LiveSuit.sh
```

9 Click "Yes" button to burn eMMC

note: when burn eMMC, it will clean all document on eMMC.



10, when all is OK ,just rebbot BPI-M2+, and boot android image from eMMC flash.

Linux software

Armbian official image for BPI-M2+

Armbian Linux have official support BPI-M2+

Image download exend link:

http://www.armbian.com/banana-pi-m2-plus/

getting start:

http://www.armbian.com/documentation/

armbian github link:

https://github.com/igorpecovnik/lib

How to burn Linux image to eMMC

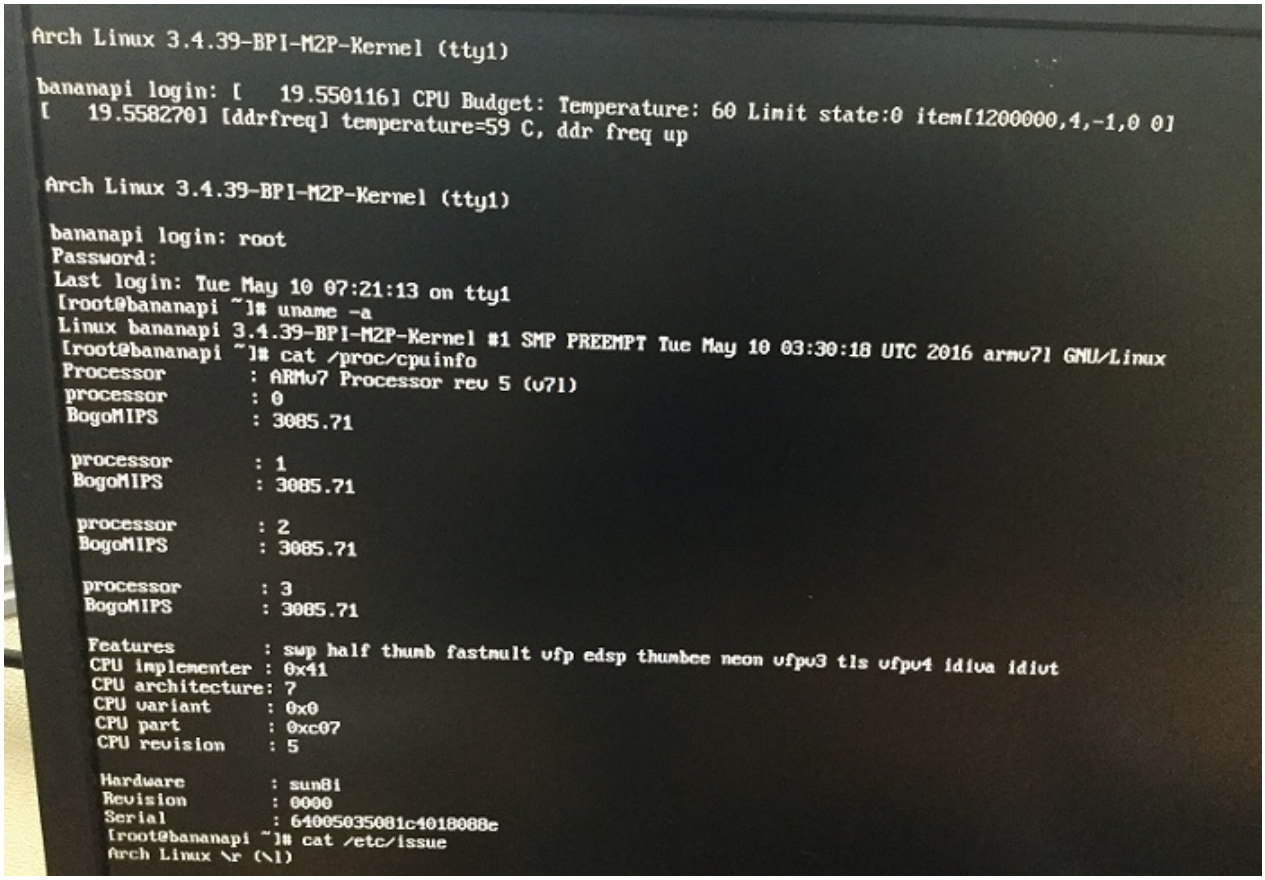
Linux for Kernel 3.4 image

allwinner BSP only support linux kernel 3.4, so we have update kernel 3.4 source code on github. and we will build image from kernel 3.4.

all driver have working fine on kernel 3.4

BPI-M2+ new image: ArchLinuxARM-lite-bpi-m2+ 2016-5-10

2016-05-10-ArchLinuxARM-lite-bpi-m2p.img.zip



1. BPI-M2P kernel 3.4
2. username & password: root/bananapi
3. support HDMI 1080P & 720P(default)
4. support eMMC
5. support GMAC
6. support WIFI
7. support bpi-bootsel cmd can switch to (bpi-m3 & bpi-m2 & bpi-m2p)

8. support uEnv.txt to fatload script.bin & uImage
9. support uEnv.txt to set video 1080P & 720P & 480P ...
10. fix rootmydevice issue

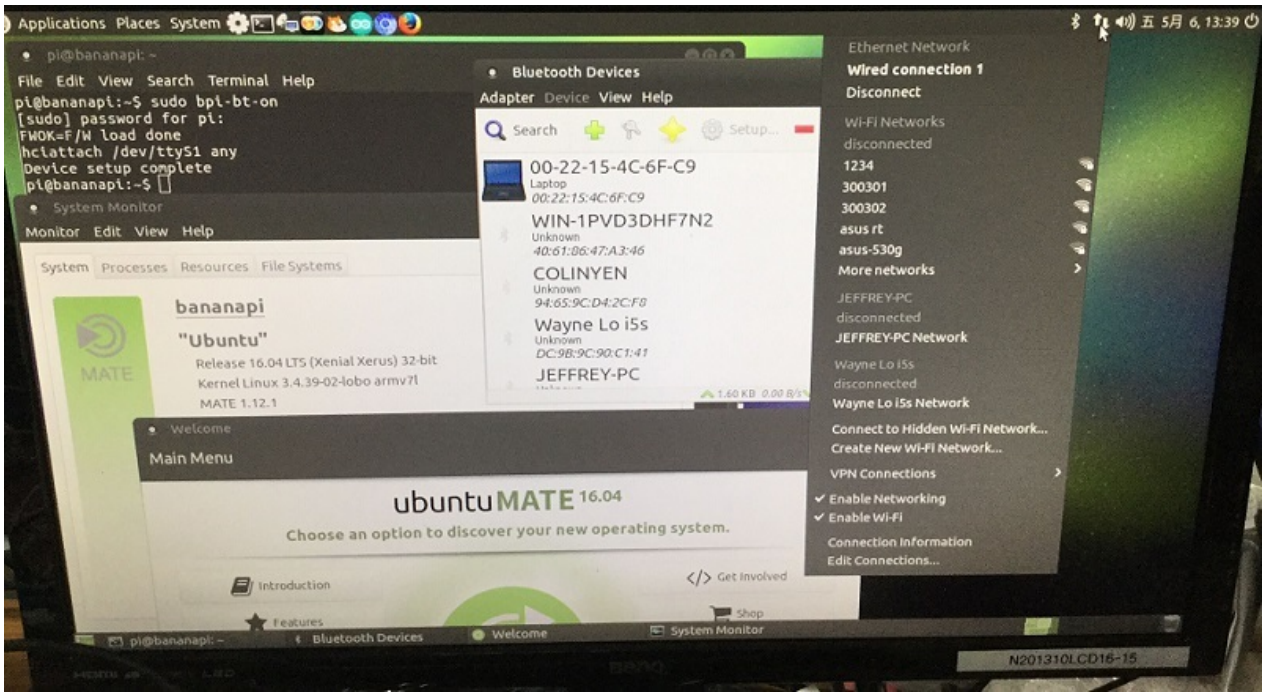
Google Drive:

https://drive.google.com/file/d/0B_YnvHgh2rwjMDd5N0dtNTVGYTA/view?usp=sharing

MD5: 4f60a9a32bac18c3f06918b0aee3b874

BPI-M2+ Ubuntu mate-16.04_Xenial mpv 1080p-bpi-m2p_preview 2016-05-05

2016-05-06-ubuntu-mate-16.04_Xenial_mpv_1080p-bpi-m2p_preview-sd-emmc.img.zip



1. BPI-M2P kernel 3.4
2. username & password: pi/bananapi , root/bananapi
3. support HDMI 1080P & 720P(default)
4. support GMAC
5. support WIFI
6. support bpi-bootsel cmd can switch to (bpi-m3 & bpi-m2 & bpi-m2p)
7. support uEnv.txt to fatload script.bin & uImage
8. support uEnv.txt to set video 1080P & 720P & 480P ...
9. support BT
10. support ov5640 camera
11. fix rootmydevice issue

issue:

- gpu not ready

Google Drive:

https://drive.google.com/file/d/0B_YnvHgh2rwjUHhRMl8zLWIwaDA/view?usp=sharing

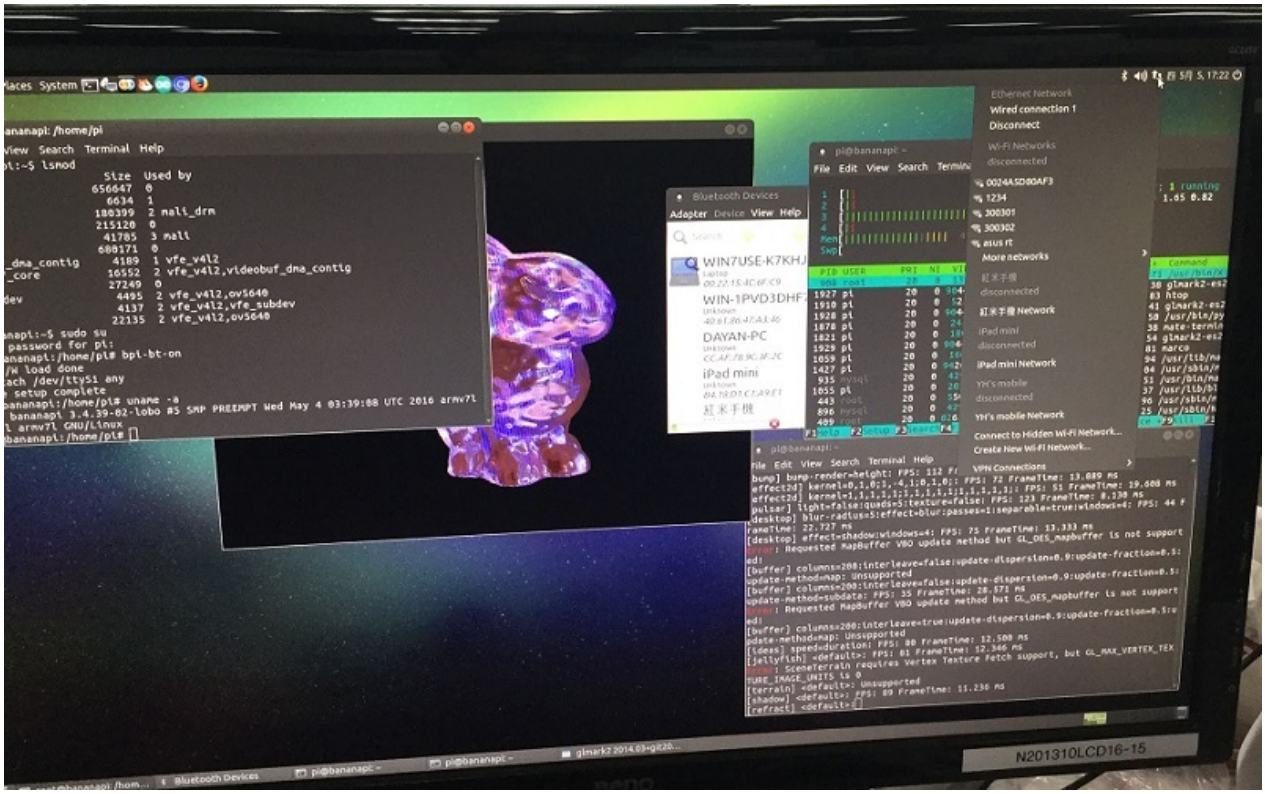
MD5: 31a8e24abc76c2ba21a02ce399315b25

discuss on forum:

http://forum.banana-pi.org/t/bpi-m2-ubuntu-mate-16-04-xenial-mpv-1080p-bpi-m2p-preview-2016-05-05/1610

BPI-M2+ Ubuntu 15.10 gpu_vpu_camera_bt_bpi-m2p_beta V1.0 2016-05-05

2016-05-05-u1510_gpu_vpu_camera_bt_bpi-m2p_beta.img.zip



1. BPI-M2P kernel 3.4
2. username & password: pi/bananapi , root/bananapi
3. support HDMI 1080P & 720P(default)
4. support GMAC

5. support WIFI
6. support bpi-bootsel cmd can switch to (bpi-m3 & bpi-m2 & bpi-m2p)
7. support uEnv.txt to fatload script.bin & uImage
8. support uEnv.txt to set video 1080P & 720P & 480P ...
9. support BT
10. support ov5640 camera
11. fix rootmydevice issue

Google Drive:

https://drive.google.com/file/d/0B_YnvHgh2rwjM1dBNnYtaWUyOVU/view?usp=sharing

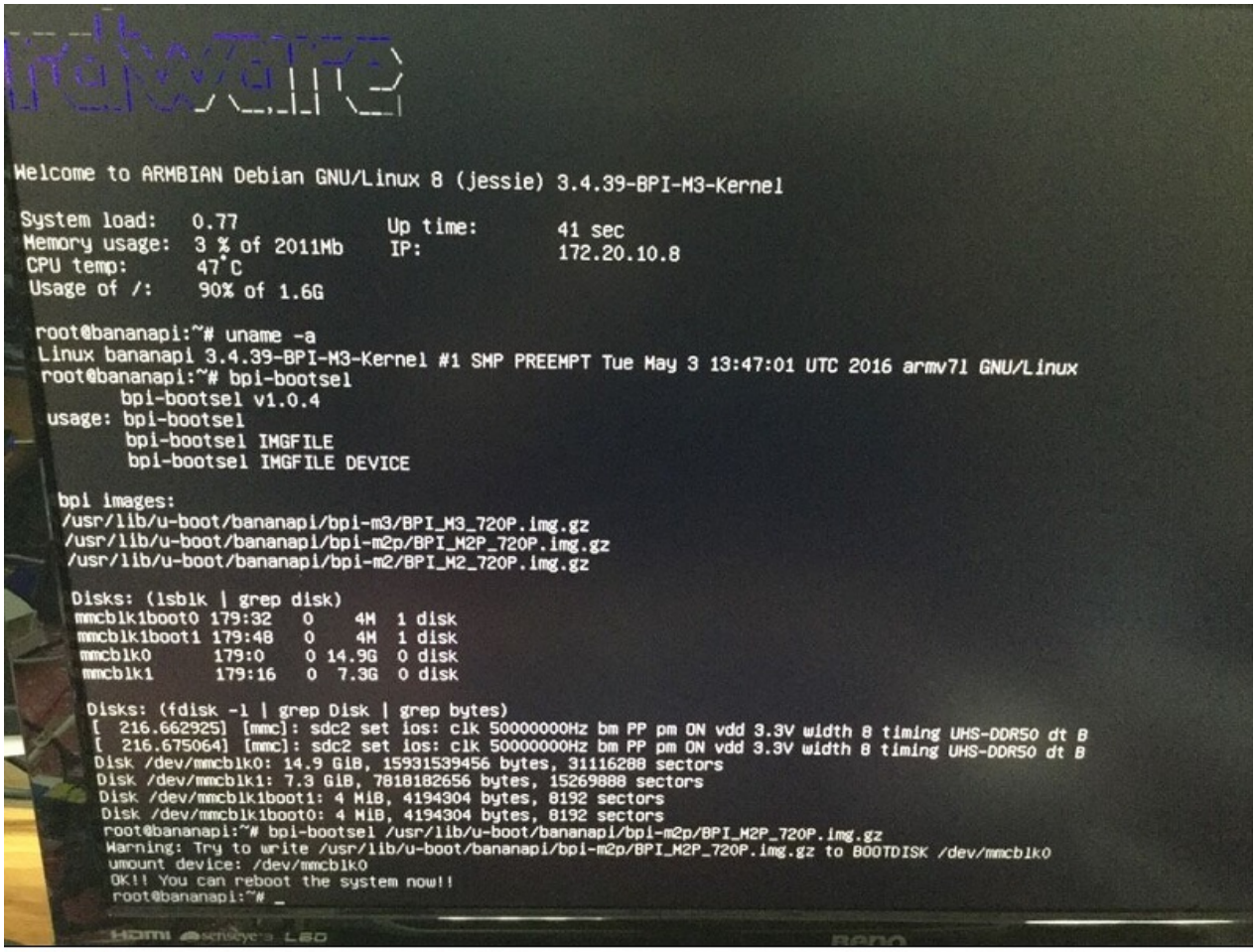
MD5: 25353a3d7c2fba11cb34b03b27f75ccf

discuss on forum:

http://forum.banana-pi.org/t/bpi-m2-ubuntu-15-10-gpu-vpu-camera-bt-bpi-m2p-beta-v1-0-2016-05-05/1606

BPI-M2+ Debian-8-jessie-lite-bpi-m2p_beta V1.0 2016-5-5

2016-05-05-debian-8-jessie-lite-bpi-m2p_beta-sd-emmc.img.zip



1. BPI-M2P kernel 3.4
2. username & password: pi/bananapi , root/bananapi
3. support HDMI 1080P & 720P(default)
4. support GMAC
5. support WIFI
6. support bpi-bootsel cmd can switch to (bpi-m3 & bpi-m2 & bpi-m2p)
7. support uEnv.txt to fatload script.bin & uImage
8. support uEnv.txt to set video 1080P & 720P & 480P ...
9. fix rootmydevice issue
10. based on armbian rootfs, thanks for armbian

Google Drive:

https://drive.google.com/file/d/0B_YnvHgh2rwjQ1g5SG03bG9YYzg/view?usp=sharing

MD5: 09bc4970b824e1c938b1b0b53604633e

discuss on forum:

http://forum.banana-pi.org/t/bpi-m2-debian-8-jessie-lite-bpi-m2p-beta-v1-0-2016-5-5/1607

Raspbian Jessie(debian 8) for BPI-M2P (20160408)

1. BPI-M2P kernel 3.4
2. username & password: pi/bananapi , root/bananapi
3. support HDMI 1080P & 720P(default)
4. support GMAC
5. support WIFI
6. support bpi-bootsel cmd can switch to (bpi-m3 & bpi-m2 & bpi-m2p)
7. support uEnv.txt to fatload script.bin & uImage
8. support uEnv.txt to set video 1080P & 720P & 480P ...
9. support node-red

issue:

1. BT4.0 driver not work .
2. camera driver not work.

Google Drive

https://drive.google.com/file/d/0B_YnvHgh2rwjQWxMSUlmMnR6Rjg/view?usp=sharing5

MD5: fd7f873e732e512f2646a57a593e2a24

how to use banana pi BPI-M3 image on BPI-M2+ , use bpi-bootsel

on BPI-M3 board: (login as root)

step 0: download https://github.com/BPI-SINOVOIP/BPI-files/blob/master/debs/linux-bananapi-bpi-m2p-kernel3_1.2.3_armhf.deb

step 1: dpkg -i linux-bananapi-bpi-m2p-kernel3_1.2.3_armhf.deb

step 2: bpi-bootsel /usr/lib/u-boot/bananapi/bpi-m2p/BPI_M2P_720P.img.gz

step 3: mkdir -p /boot/bananapi/bpi-m2p

step 4: cp -a /usr/lib/u-boot/bananapi/bpi-m2p/linux /boot/bananapi/bpi-m2p

step 5: cd /boot/bananapi/bpi-m2p/linux ; vi uEnv.txt (if you want to change)

step 6: poweroff & remove SD card.on

BPI-M2+ board:

step 7: insert SD card and power on

log on BPI-M3:

```
root@bananapi:/# dpkg -l | grep bananapi
ii  bananapi-bpi-tools                    1.0.1
     armhf        Banaan Pi:  tools
ii  linux-bananapi-bpi-m2-kernel3         1.2
     armhf        Banaan Pi BPI-M2:  linux kernel 3.3 image & modules
ii  linux-bananapi-bpi-m3-kernel3         1.2.6
     armhf        Banaan Pi BPI-M3:  linux kernel 3.4 image & modules
ii  linux-firmware-bananapi-bpi-wifi      1.0
     armhf        Banaan Pi: linux kernel firmware for wifi ap6181 & ap6212
root@bananapi:/# dpkg -i linux-bananapi-bpi-m2p-kernel3_1.2.3_armhf.deb
Selecting previously unselected package linux-bananapi-bpi-m2p-kernel3.
(Reading database ... 213272 files and directories currently installed.)
Preparing to unpack linux-bananapi-bpi-m2p-kernel3_1.2.3_armhf.deb ...
Unpacking linux-bananapi-bpi-m2p-kernel3 (1.2.3) ...
Setting up linux-bananapi-bpi-m2p-kernel3 (1.2.3) ...
root@bananapi:/# dpkg -l | grep bananapi
ii  bananapi-bpi-tools                    1.0.1
     armhf        Banaan Pi:  tools
ii  linux-bananapi-bpi-m2-kernel3         1.2
     armhf        Banaan Pi BPI-M2:  linux kernel 3.3 image & modules
ii  linux-bananapi-bpi-m2p-kernel3        1.2.3
     armhf        Banaan Pi BPI-M2P:  linux kernel 3.4 image & modules
```

```
ii  linux-bananapi-bpi-m3-kernel3        1.2.6
     armhf        Banaan Pi BPI-M3:  linux kernel 3.4 image & modules
ii  linux-firmware-bananapi-bpi-wifi      1.0
     armhf        Banaan Pi: linux kernel firmware for wifi ap6181 & ap6212
root@bananapi:/# bpi-bootsel
usage: bpi-bootsel v1.0.1
       bpi-bootsel IMGFILE

bpi images:
/usr/lib/u-boot/bananapi/bpi-m2/BPI_M2_USB_LCD7.img.gz
/usr/lib/u-boot/bananapi/bpi-m2/BPI_M2_720P.img.gz
/usr/lib/u-boot/bananapi/bpi-m2/BPI_M2_USB_1080P.img.gz
/usr/lib/u-boot/bananapi/bpi-m2/BPI_M2_1080P.img.gz
/usr/lib/u-boot/bananapi/bpi-m2/BPI_M2_USB_720P.img.gz
/usr/lib/u-boot/bananapi/bpi-m2/BPI_M2_LCD7.img.gz
/usr/lib/u-boot/bananapi/bpi-m2p/BPI_M2P_720P.img.gz
/usr/lib/u-boot/bananapi/bpi-m3/BPI_M3_USB_720P.img.gz
/usr/lib/u-boot/bananapi/bpi-m3/BPI_M3_LCD7.img.gz
/usr/lib/u-boot/bananapi/bpi-m3/BPI_M3_720P.img.gz
/usr/lib/u-boot/bananapi/bpi-m3/BPI_M3_1080P.img.gz
/usr/lib/u-boot/bananapi/bpi-m3/BPI_M3_USB_LCD7.img.gz
/usr/lib/u-boot/bananapi/bpi-m3/BPI_M3_USB_1080P.img.gz
root@bananapi:/# bpi-bootsel /usr/lib/u-boot/bananapi/bpi-m2p/BPI_M2P_720P.img.gz
Warning: Try to write /usr/lib/u-boot/bananapi/bpi-m2p/BPI_M2P_720P.img.gz to BO
OTDISK /dev/mmcblk0
OK!! You can reboot the system now!!
root@bananapi:/# df -k
Filesystem     1K-blocks    Used Available Use% Mounted on
/dev/root        7156088 5833956    958612  86% /
devtmpfs          767752       0    767752   0% /dev
tmpfs            1030072     676   1029396   1% /dev/shm
tmpfs            1030072   11404   1018668   2% /run
tmpfs               5120       4      5116   1% /run/lock
tmpfs            1030072       0   1030072   0% /sys/fs/cgroup
/dev/mmcblk0p1    261868   67512    194356  26% /boot
tmpfs             206016      36    205980   1% /run/user/1000
/dev/mmcblk1p2   7156088 5064340   1728228  75% /media/pi/BPI-ROOT
/dev/mmcblk1p1    261868   29556    232312  12% /media/pi/BPI-BOOT
tmpfs             206016       0    206016   0% /run/user/0
root@bananapi:/# ls -l /boot/bananapi/
bpi-m2p/                        sun7i-a20-bananapi-m1-plus.dtb
bpi-m3/                         sun7i-a20-bananapi-r1.dtb
sun6i-a31s-bananapi-m2.dtb      uboot/
sun6i-a31s-sinovoip-bpi-m2.dtb  uImage
sun7i-a20-bananapi.dtb
root@bananapi:/# rm -rf /boot/bananapi/bpi-m2p/
root@bananapi:/# ls -l /boot/bananapi/
bpi-m3/                         sun7i-a20-bananapi-m1-plus.dtb
sun6i-a31s-bananapi-m2.dtb      sun7i-a20-bananapi-r1.dtb
sun6i-a31s-sinovoip-bpi-m2.dtb  uboot/
sun7i-a20-bananapi.dtb          uImage
root@bananapi:/# mkdir -p /boot/bananapi/bpi-m2p
root@bananapi:/# cp -a /usr/lib/u-boot/bananapi/bpi-m2p/linux /boot/bananapi/bpi
```

```
-m2p
cp: failed to preserve ownership for ‘’/boot/bananapi/bpi-m2p/linux/script.bin
’: Operation not permitted
cp: failed to preserve ownership for ‘’/boot/bananapi/bpi-m2p/linux/uEnv.txt  ’
: Operation not permitted
cp: failed to preserve ownership for ‘’/boot/bananapi/bpi-m2p/linux’’: Operati
```

video demo:

https://www.youtube.com/watch?v=aF_WZFDxGs4

mainline Linux

Many open source development help us to use mainline linux on BPI-M2+.

if someone want to help use ,please contact us ,we will send free sample to you.

Mainline uboot

start with Sinovoip_BPI_M2_plus_defconfig (tested with 2016.03 and sun8i-h3-bananapi-m2plus.dts from below).

It can boot from eMMC, the SD card or via FEL.

BPI-M2+ mainline kernel

Initial H3 patches have been submitted to the mainline kernel, but have not landed yet. Currently you can find these patches in the arm-linux mailing list, or alternatively in one of the work-in-progress kernel forks:

- Maxime Ripard's branch 'sunxi/for-next' at https://git.kernel.org/cgit/linux/kernel/git/mripard/linux.git/log/?h=sunxi/for-next (very basic H3 support, without USB)
- Hans de Goede's branch 'sunxi-wip' at https://github.com/jwrdegoede/linux-sunxi/tree/sunxi-wip (many work-in-progress patches, including H3 and USB support for it)
- Siarhei Siamashka's branch '20151223-h3-mainline-smp-hack' at https://github.com/ssvb/linux-sunxi/tree/20151223-h3-mainline-smp-hack (minimal set of H3 patches, with USB and SMP)

sun8i-h3-bananapi-m2plus.dts:http://pastebin.com/sKfj2tTW (everything working except of WiFi/BT due to lack of interest)

Armbian official image for BPI-M2+

Armbian Linux have official support BPI-M1,BPI-M1+,BPI-M2,BPI-M2+

Image download and armbian forum page:

http://www.armbian.com/download/

getting start:

http://www.armbian.com/documentation/

armbian github link:

https://github.com/igorpecovnik/lib

BPI-M2+ WiringPi

install BPI-M2+ WiringPi:

1，Download WiringPi from github For BPI-M2+

```
git clone https://github.com/BPI-SINOVOIP/BPI-WiringPi.git -b BPI_M2plus
```

2，Installation：

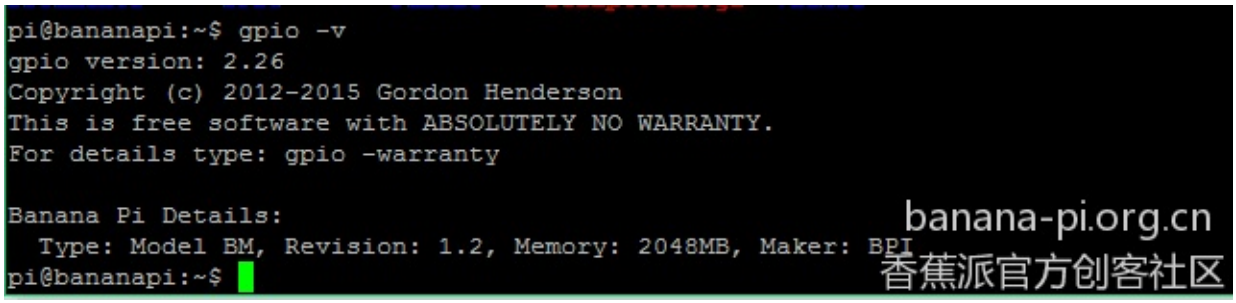
```
cd BPI-WiringPi
```

```
chmod +x ./build
```

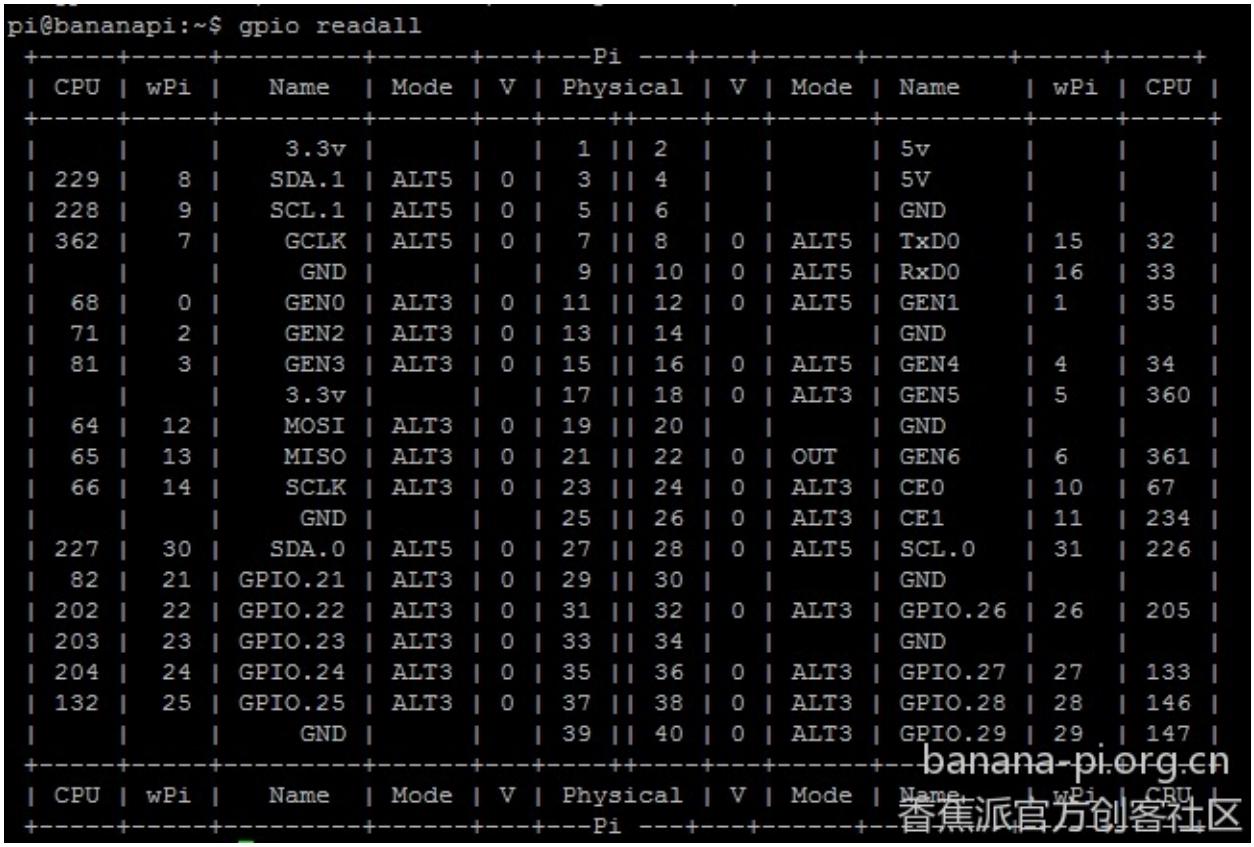
```
sudo ./build
```

3，test wiringPi is install success

```
gpio -v
```




```
gpio readall
```



4，create new : blink.c

```
#include <wiringPi.h>
int main(void)
{
  wiringPiSetup() ;
  pinMode (0, OUTPUT) ;
  for(;;)
  {
    digitalWrite(0, HIGH) ; delay (500) ;
    digitalWrite(0,  LOW) ; delay (500) ;
  }
}
```

compile and run it:

```
gcc -Wall -o blink blink.c -lwiringPi
```

runing it:

```
sudo ./blink
```

BPI have many extend board support WiringPi. so you can free DIY by youself:

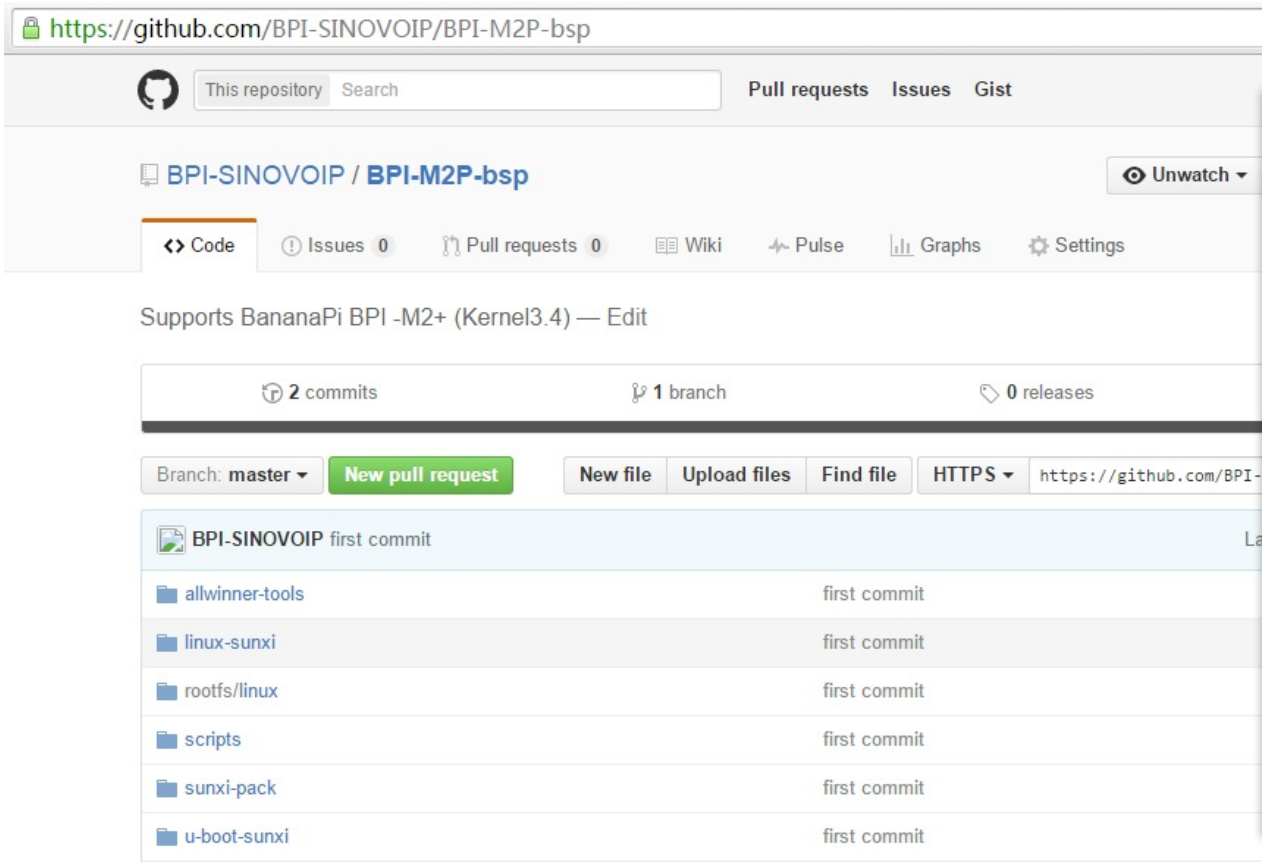
more about BPI extend board,please see:

https://bananapi.gitbooks.io/bpi-accessories/content/

BPI-M2+ source code on github

All newest source code have update on this github site.

https://github.com/BPI-SINOVOIP/BPI-M2P-bsp



BPI-M2+ Reference documents

H3 Linux-sunxi wiki

about allwinner H3 chip,please reference this link:

http://linux-sunxi.org/H3

all about allwinner chip：

https://en.wikipedia.org/wiki/Allwinner_Technology

H3 Manual build howto

banana pi BPI-M2+ use allwinner H3 chip onboard.

This page describes the process to combine Allwinners binary boot0, an SDK U-Boot, an SDK linux kernel and other bits together to create a useful SD-card from scratch, the basis for further hacking.

This page is only suited for H3 based devices, please look under See also for other manual build howtos.

We of course do not build a whole distribution, we only build U-Boot, the kernel and a handful of tools, and then use an existing rootfs to get a useful system. Depending on the rootfs size, you might want to use a 2GB or larger SD Card. SD-card partitioning and formatting will be taken care of later.

Link:

http://linux-sunxi.org/H3_Manual_build_howto

BPI-M2+ linux-sunxi wiki

http://linux-sunxi.org/Sinovoip_Banana_Pi_M2%2B

Banana pi wikipedia wiki

all banana pi development board wikipedia wiki

https://en.wikipedia.org/wiki/Banana_Pi

BPI-M2+ online video

- Banana pi M2+ android

https://www.youtube.com/watch?time_continue=8&v=Bxbj0zA_0vI

- OpenElec on banana pi M2+ 4K and arcade test

https://www.youtube.com/watch?v=FoH4TaepMMY

- banana pi BPI-M2+ (BPI-M2 plus) test IR remote control

https://www.youtube.com/watch?v=HhW_G85Byio

- banana pi BPI-M2+ decode 1080P test

https://www.youtube.com/watch?v=sZAbhTNWB94

- Armbian Banana pi M2+ demo

https://www.youtube.com/watch?v=uTJp78d1TFU

- Banana PI M2+ gpu performance (Armbian)

https://www.youtube.com/watch?v=q2vtjxJ4N30

- Openelec Kodi 16.0 (xbmc) on the Banana Pi BPI M2+

https://www.youtube.com/watch?v=vPIbE5znU_8

- Banana pi BPI-M2+ support 4K TV

  https://www.youtube.com/watch?v=hteLkEo2id0

Allwinner GPL_Violations

Allwinner has repeatedly violated the GPL (and by proxy so have most hardware manufacturers and resellers using or selling products based on Allwinner chipsets). Either by not providing (Linux/Android) kernel or u-boot source at all, or by delivering trees with pre-built binaries and no matching source code. They even blatantly use LGPL licensed code in their userspace libraries for media decoding.

Over time, Allwinner has only increased the binary blobs present in their kernel trees, showing clearly that - even though Allwinner in the meantime joined Linaro - it is not progressing. Quite the opposite actually, and one has to worry about what value Linaro membership really has if a member is allowed to behave like this. Allwinner also joined the Linux Foundation as of June 2015, while compliance issues clearly remain.

http://linux-sunxi.org/GPL_Violations

Linux mainlining effort

The purpose of this page is to try and define sub-goals and milestones for the mainlining effort, containing goals and sub-goals with milestones for adding Allwinner support in the upstream mainline Linux Kernel.

It is very important to note that this is intended as a rough set of minimal goals - it is not meant to collide with the huge effort of rewriting major drivers!

more ,please see link:

http://linux-sunxi.org/Linux_mainlining_effort

BPI-M2+ quality guarantee

BPI-M2+ BT 4.0 test report

Anritsu BlueTest2 Test Report

Test Set Serial Number: 6K00006250

EUT Bluetooth Address: 983B16000000

Date: 2016/3/25 Time: 11:13:20

Overall Result: PASS

TRM/CA/01/C (Output Power)

Packet Length Tested: DH5

Hopping ON	Low	Med	High	Limits
Average Power	10.36 dBm	9.71 dBm	8.80 dBm	
Max Power	10.37 dBm	9.74 dBm	8.81 dBm	< 20.00 dBm
Min Power	10.36 dBm	9.70 dBm	8.80 dBm	> -6.00 dBm
Peak Power	10.78 dBm	10.08 dBm	9.19 dBm	< 23.00 dBm
Total Packets Failed	0	0	0	
Total Packets Tested	10	10	10	
Result	Pass	Pass	Pass	

TRM/CA/03/C (Power Control)

Packet Length Tested: DH1

Hopping OFF	Low	Med	High	Limits
Max Power	10.40 dB	9.70 dB	8.70 dB	
Min Power	-20.90 dB	-22.00 dB	-22.70 dB	
Max Power Step	5.40 dB	5.70 dB	5.50 dB	<= 8.00 dB
Min Power Step	4.00 dB	3.70 dB	3.40 dB	>= 2.00 dB
Total Packets Failed	0	0	0	
Total Packets Tested	14	14	14	
Result	Pass	Pass	Pass	

TRM/CA/08/C (Initial Carrier)

Packet Length Tested: DH1

Hopping ON	Low	Med	High	Limits
Average Offset	21.9 kHz	18.0 kHz	19.1 kHz	
Max Offset	26.3 kHz	20.9 kHz	22.6 kHz	<= 75 kHz
Min Offset	19.0 kHz	15.8 kHz	14.4 kHz	<= 75 kHz
Total Packets Failed	0	0	0	
Total Packets Tested	10	10	10	
Result	Pass	Pass	Pass	

TRM/CA/09/C (Carrier Drift)

Hopping On - Low Channel	DH1	DH3	DH5	Limits
Drift Rate / 50μs	-3.73 kHz	-5.45 kHz	-5.88 kHz	+/- 20 kHz
Max Drift	-7 kHz	8 kHz	8 kHz	DH1: +/- 25kHz
Average Drift	0 kHz	-1 kHz	2 kHz	DH3: +/- 40kHz
Total Packets Failed	0	0	0	DH5: +/- 40kHz
Total Packets Tested	10	10	10	
Overall Result	Pass	Pass	Pass	

Hopping On - Med Channel	DH1	DH3	DH5	Limits
Drift Rate / 50μs	4.73 kHz	-6.42 kHz	-5.47 kHz	+/- 20 kHz
Max Drift	11 kHz	8 kHz	7 kHz	DH1: +/- 25kHz
Average Drift	2 kHz	-1 kHz	0 kHz	DH3: +/- 40kHz
Total Packets Failed	0	0	0	DH5: +/- 40kHz
Total Packets Tested	10	10	10	
Overall Result	Pass	Pass	Pass	

Hopping On - High Channel	DH1	DH3	DH5	Limits
Drift Rate / 50μs	-6.00 kHz	-6.41 kHz	-5.82 kHz	+/- 20 kHz
Max Drift	7 kHz	-9 kHz	10 kHz	DH1: +/- 25kHz
Average Drift	3 kHz	-1 kHz	0 kHz	DH3: +/- 40kHz
Total Packets Failed	0	0	0	DH5: +/- 40kHz
Total Packets Tested	10	10	10	
Overall Result	Pass	Pass	Pass	

TRM/CA/07/C (Modulation Characteristic)

Packet Length Tested: DH5

Hopping OFF	**Low**	**Med**	**High**	**Limits**
'F1avg'	158.9 kHz	158.8 kHz	157.2 kHz	140kHz < F1 < 175kHz
'F1max'	165.5 kHz	166.1 kHz	165.5 kHz	
F1 Packets Failed	0	0	0	
'F2avg'	161.2 kHz	161.7 kHz	162.0 kHz	
'F2max'	146.3 kHz	148.4 kHz	146.6 kHz	>= 115 kHz
'F2max' Pass Rate	100.00%	100.00%	100.00%	
F1/F2 Ratio	1.01	1.01	1.03	>= 0.8
Total Packets Tested	20	20	20	
Result	Pass	Pass	Pass	

RCV/CA/01/C (Single Sensitivity)

Power Level: -86 dBm, Dirty Tx Status: ON

Hopping ON	**Any**	**Limits**
Overall BER	0.01%	<= 0.1%
Overall FER	0.86%	<= 100%
Packets Sent	7408	
Total Packets Tested	7394	
Bit Errors	115	
Total Packets Failed	64	
CRC Errors	48	
Length Errors	2	
Lost Packets	14	
Result	Pass	

Hopping OFF	**Low**	**Med**	**High**	**Limits**
Overall BER	0.00%	0.00%	0.00%	<= 0.1%
Overall FER	0.16%	0.04%	0.15%	<= 100%
Packets Sent	7408	7408	7408	
Total Packets Tested	7397	7408	7398	
Bit Errors	1	2	1	
Total Packets Failed	12	3	11	
CRC Errors	1	3	1	
Length Errors	0	0	0	
Lost Packets	11	0	10	
Result	Pass	Pass	Pass	

RCV/CA/02/C (Multi Slot Sensitivity)

Power Level: -86 dBm, Dirty Tx Status: ON, Packet Length Tested: DH5

Hopping ON	**Any**	**Limits**
Overall BER	0.00%	<= 0.1%
Overall FER	1.02%	<= 100%
Packets Sent	590	
Total Packets Tested	589	
Bit Errors	45	
Total Packets Failed	6	
CRC Errors	5	
Length Errors	0	
Lost Packets	1	
Result	Pass	

Hopping OFF	**Low**	**Med**	**High**	**Limits**
Overall BER	0.00%	0.00%	0.00%	<= 0.1%
Overall FER	0.00%	0.34%	0.17%	<= 100%
Packets Sent	590	590	590	
Total Packets Tested	590	590	590	
Bit Errors	0	2	1	
Total Packets Failed	0	2	1	
CRC Errors	0	2	1	
Length Errors	0	0	0	
Lost Packets	0	0	0	
Result	Pass	Pass	Pass	

RCV/CA/06/C (Max Input Level)

Power Level: -20dBm

Hopping OFF	Low	Med	High	Limits
Overall BER	0.00%	0.00%	0.00%	<= 0.1%
Overall FER	0.00%	0.00%	0.03%	<= 100%
Packets Sent	7408	7408	7408	
Total Packets Tested	7408	7408	7406	
Bit Errors	0	0	0	
Total Packets Failed	0	0	2	
CRC Errors	0	0	0	
Length Errors	0	0	0	
Lost Packets	0	0	2	
Result	Pass	Pass	Pass	

TRM/CA/10/C (EDR Relative Transmit Power)

2Mbps Packet Length: 2-DH5, 3Mbps Packet Length: 3-DH5

2Mbits/sec **EUT Max**

Hopping OFF	Low	Med	High	Limits
Max difference	0.10 dB	0.05 dB	-0.04 dB	Max: 1.00 dB
Min difference	0.06 dB	0.02 dB	-0.01 dB	Min: -4.00 dB
Avg difference	0.08 dB	0.03 dB	-0.03 dB	
GFSK Max	8.15 dBm	7.25 dBm	6.40 dBm	
GFSK Min	8.12 dBm	7.23 dBm	6.39 dBm	
GFSK Avg	8.13 dBm	7.24 dBm	6.40 dBm	
GFSK Pk	8.38 dBm	7.45 dBm	6.63 dBm	
DPSK Max	8.22 dBm	7.28 dBm	6.38 dBm	
DPSK Min	8.18 dBm	7.25 dBm	6.35 dBm	
DPSK Avg	8.21 dBm	7.27 dBm	6.37 dBm	
DPSK Pk	10.64 dBm	9.62 dBm	8.57 dBm	
Result	Pass	Pass	Pass	

2Mbits/sec **EUT Min**

Hopping OFF	Low	Med	High	Limits
Max difference	0.30 dB	0.29 dB	0.30 dB	Max: 1.00 dB
Min difference	0.27 dB	0.26 dB	0.26 dB	Min: -4.00 dB
Avg difference	0.29 dB	0.28 dB	0.29 dB	
GFSK Max	-25.38 dBm	-27.35 dBm	-28.30 dBm	
GFSK Min	-25.39 dBm	-27.36 dBm	-28.33 dBm	
GFSK Avg	-25.38 dBm	-27.35 dBm	-28.31 dBm	
GFSK Pk	-25.18 dBm	-27.17 dBm	-28.08 dBm	
DPSK Max	-25.08 dBm	-27.08 dBm	-28.02 dBm	
DPSK Min	-25.11 dBm	-27.09 dBm	-28.04 dBm	
DPSK Avg	-25.09 dBm	-27.08 dBm	-28.03 dBm	
DPSK Pk	-22.34 dBm	-24.31 dBm	-25.20 dBm	
Result	Pass	Pass	Pass	

3Mbits/sec **EUT Max**

Hopping OFF	Low	Med	High	Limits
Max difference	0.09 dB	0.05 dB	-0.03 dB	Max: 1.00 dB
Min difference	0.06 dB	0.02 dB	-0.02 dB	Min: -4.00 dB
Avg difference	0.08 dB	0.04 dB	-0.02 dB	
GFSK Max	8.06 dBm	7.25 dBm	6.40 dBm	
GFSK Min	8.02 dBm	7.23 dBm	6.39 dBm	
GFSK Avg	8.04 dBm	7.24 dBm	6.40 dBm	
GFSK Pk	8.27 dBm	7.48 dBm	6.62 dBm	
DPSK Max	8.14 dBm	7.29 dBm	6.38 dBm	
DPSK Min	8.10 dBm	7.26 dBm	6.36 dBm	
DPSK Avg	8.11 dBm	7.28 dBm	6.37 dBm	
DPSK Pk	10.54 dBm	9.65 dBm	8.59 dBm	
Result	Pass	Pass	Pass	

3Mbits/sec		EUT Min		
Hopping OFF	**Low**	**Med**	**High**	**Limits**
Max difference	0.29 dB	0.29 dB	0.30 dB	Max: 1.00 dB
Min difference	0.27 dB	0.27 dB	0.26 dB	Min: -4.00 dB
Avg difference	0.28 dB	0.28 dB	0.29 dB	
GFSK Max	-25.36 dBm	-27.35 dBm	-28.31 dBm	
GFSK Min	-25.37 dBm	-27.37 dBm	-28.33 dBm	
GFSK Avg	-25.36 dBm	-27.36 dBm	-28.31 dBm	
GFSK Pk	-25.14 dBm	-27.18 dBm	-28.10 dBm	
DPSK Max	-25.08 dBm	-27.07 dBm	-28.03 dBm	
DPSK Min	-25.11 dBm	-27.10 dBm	-28.05 dBm	
DPSK Avg	-25.09 dBm	-27.08 dBm	-28.03 dBm	
DPSK Pk	-22.24 dBm	-24.21 dBm	-25.11 dBm	
Result	Pass	Pass	Pass	

TRM/CA/11/C (EDR Carrier Frequency Stability and Modulation Accuracy)

2Mbps Packet Length: 2-DH5, 3Mbps Packet Length: 3-DH5

		2Mbits/sec		
Hopping OFF	**Low**	**Med**	**High**	**Limits**
Initial Frequency Error	21.7 kHz	20.7 kHz	19.1 kHz	-75 kHz < ωi < 75 kHz
Frequency Error	1.1 kHz	-1.5 kHz	1.6 kHz	-10 kHz < ωo < 10 kHz
Block Frequency Error	22.1 kHz	20.7 kHz	19.4 kHz	-75 kHz < ωi + ωo < 75 kHz
RMS DEVM	0.054	0.059	0.061	<= 0.2 (2Mbps)
Peak DEVM	0.136	0.156	0.157	<= 0.35 (2Mbps)
99% DEVM	100.00%	100.00%	100.00%	% Symbols <= 0.3 (2Mbps)
Average RMS DEVM	0.042	0.047	0.051	
Result	Pass	Pass	Pass	
Hopping OFF	**Low**	**Med**	**High**	
Initial Frequency Error	21.4 kHz	20.3 kHz	19.5 kHz	-75 kHz < ωi < 75 kHz
Frequency Error	1.3 kHz	-1.2 kHz	-2 kHz	-10 kHz < ωo < 10 kHz
Block Frequency Error	22.1 kHz	20.9 kHz	19.5 kHz	-75 kHz < ωi + ωo < 75 kHz
RMS DEVM	0.052	0.058	0.063	<= 0.13 (3Mbps)
Peak DEVM	0.132	0.140	0.159	<= 0.25 (3Mbps)
99% DEVM	100.00%	100.00%	100.00%	% Symbols <= 0.2 (3Mbps)
Average RMS DEVM	0.041	0.044	0.049	
Result	Pass	Pass	Pass	

TRM/CA/12/C (EDR Differential Phase Encoding)

2Mbps Packet Length: 2-DH1, 3Mbps Packet Length: 3-DH1

		2Mbits/sec		
Hopping OFF	**Low**	**Med**	**High**	**Limits**
Packets Received	100	n/a	n/a	
Packets in Error	0	n/a	n/a	
Percentage	100%	n/a	n/a	99 %
CFC FERs	0	n/a	n/a	
Length FERs	0	n/a	n/a	
Lost Pkt FERs	0	n/a	n/a	
Result	Pass	n/a	n/a	

		3Mbits/sec		
Hopping OFF	**Low**	**Med**	**High**	**Limits**
Packets Received	100	n/a	n/a	
Packets in Error	0	n/a	n/a	
Percentage	100%	n/a	n/a	99 %
CFC FERs	0	n/a	n/a	
Length FERs	0	n/a	n/a	
Lost Pkt FERs	0	n/a	n/a	
Result	Pass	n/a	n/a	

RCV/CA/07/C (EDR Sensitivity)

Power Level: -86 dBm, Dirty Tx Status: ON, 2Mbps Packet Length: 2-DH5, 3Mbps Packet Length: 3-DH5

		2Mbits/sec		
Hopping OFF	**Low**	**Med**	**High**	**Limits**
Overall BER	0.00E+000	0.00E+000	0.00E+000	7.0E-005
Bits in error	0	0	0	1.0E-004
Packets sent	300	300	300	
Packets in error	1	0	0	
CFC FERs	0	0	0	
Length FERs	0	0	0	
Lost Pkt FERs	1	0	0	
Packets received	299	300	300	
Result	Pass	Pass	Pass	

		3Mbits/sec		
Hopping OFF	**Low**	**Med**	**High**	**Limits**
Overall BER	1.81E-005	1.98E-005	5.25E-006	7.0E-005
Bits in error	31	34	9	1.0E-004
Packets sent	210	210	210	
Packets in error	27	23	9	
CFC FERs	27	23	9	
Length FERs	0	0	0	
Lost Pkt FERs	0	0	0	
Packets received	210	210	210	
Result	Pass	Pass	Pass	

RCV/CA/08/C (EDR BER Floor Sensitivity)

Power Level: -86 dBm, 2Mbps Packet Length: 2-DH5, 3Mbps Packet Length: 3-DH5

2Mbits/sec

Hopping OFF	**Low**	**Med**	**High**	**Limits**
Overall BER	0.00E+000	0.00E+000	0.00E+000	7.00E-006
Bits in error	0	0	0	1.00E-005
Packets sent	1500	1500	1500	
Packets in error	0	0	0	
CFC FERs	0	0	0	
Length FERs	0	0	0	
Lost Pkt FERs	0	0	0	
Packets received	1500	1500	1500	
Result	Pass	Pass	Pass	

3Mbits/sec

Hopping OFF	**Low**	**Med**	**High**	**Limits**
Overall BER	1.48E-006	6.93E-006	1.85E-006	7.00E-006
Bits in error	12	56	15	1.00E-005
Packets sent	990	990	990	
Packets in error	12	24	12	
CFC FERs	12	24	12	
Length FERs	0	0	0	
Lost Pkt FERs	0	0	0	
Packets received	990	990	990	
Result	Pass	Pass	Pass	

RCV/CA/10/C (EDR Maximum Input Power)

Power Level: -20 dBm, 2Mbps Packet Length: 2-DH5, 3Mbps Packet Length: 3-DH5

2Mbits/sec

Hopping OFF	**Low**	**Med**	**High**	**Limits**
Overall BER	0.00E+000	0.00E+000	0.00E+000	1.00E-003
Bits in error	0	0	0	
Packets sent	295	295	295	
Packets in error	1	0	0	
CFC FERs	0	0	0	
Length FERs	0	0	0	
Lost Pkt FERs	1	0	0	
Packets received	294	295	295	
Result	Pass	Pass	Pass	

3Mbits/sec

Hopping OFF	**Low**	**Med**	**High**	**Limits**
Overall BER	0.00E+000	0.00E+000	0.00E+000	1.00E-003
Bits in error	0	0	0	
Packets sent	196	196	196	
Packets in error	0	0	0	
CFC FERs	0	0	0	
Length FERs	0	0	0	
Lost Pkt FERs	0	0	0	
Packets received	196	196	196	
Result	Pass	Pass	Pass	

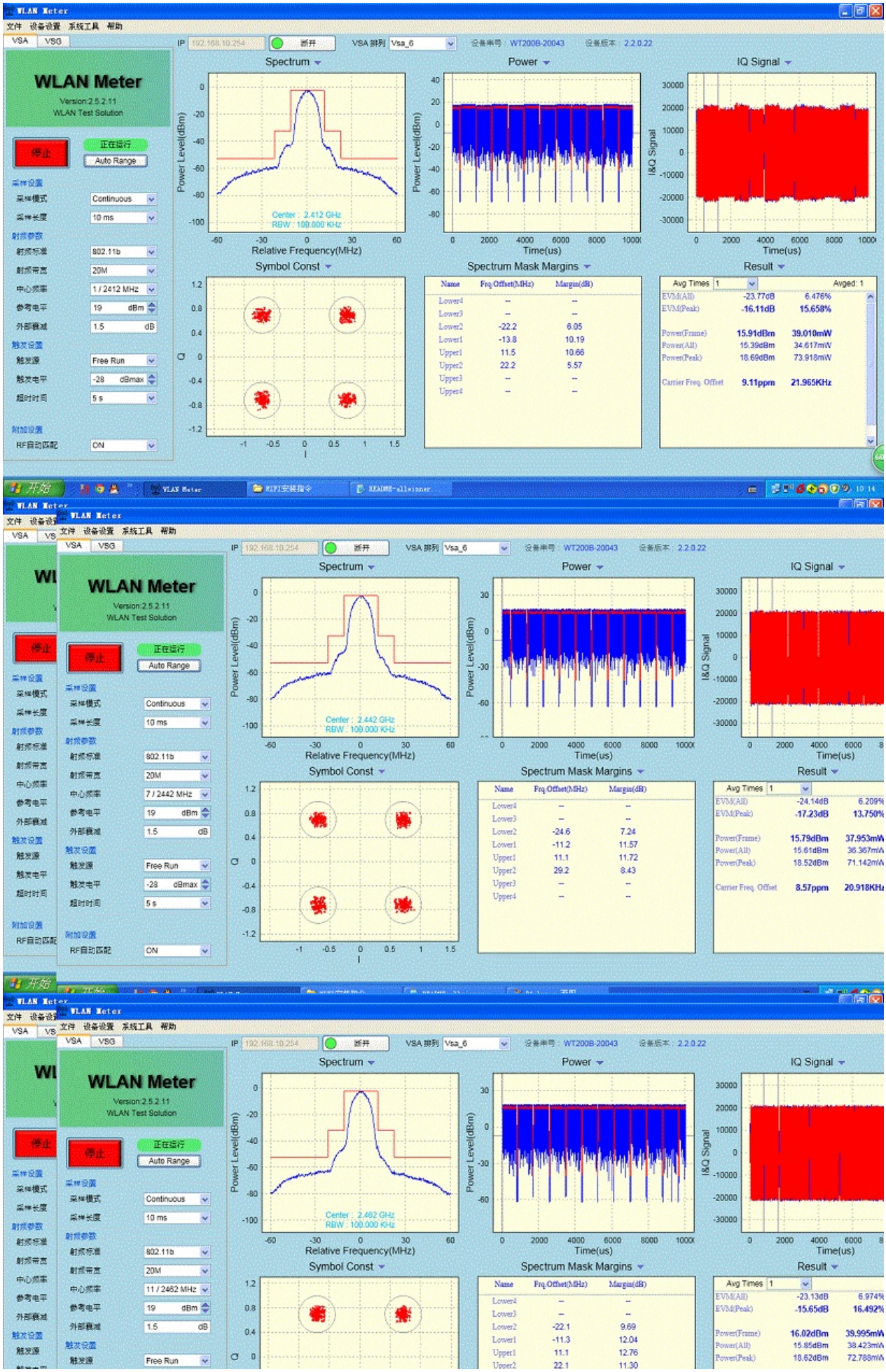
---- Report End ----

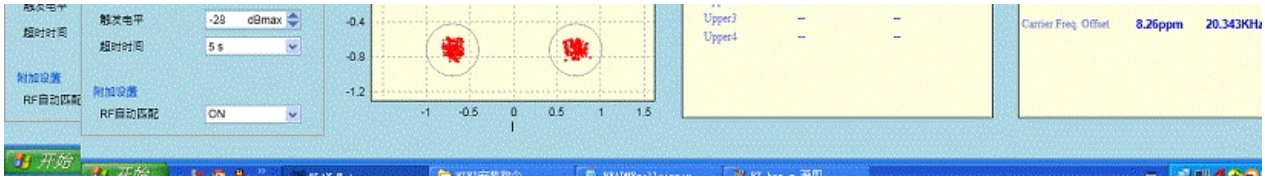
BPI-M2+ WIFI Lab test

Date: 2016/3/25

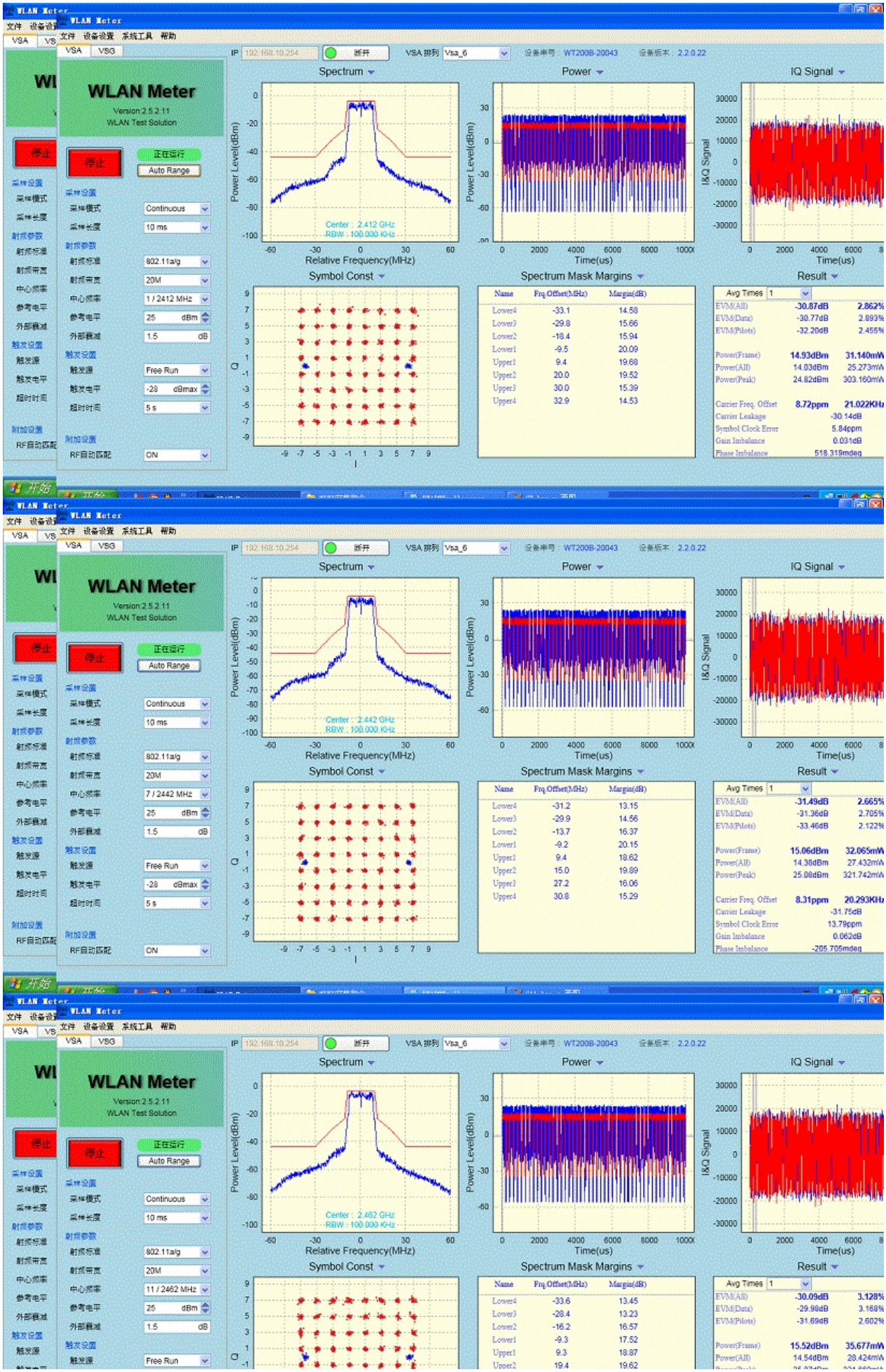
Overall Result: **PASS**

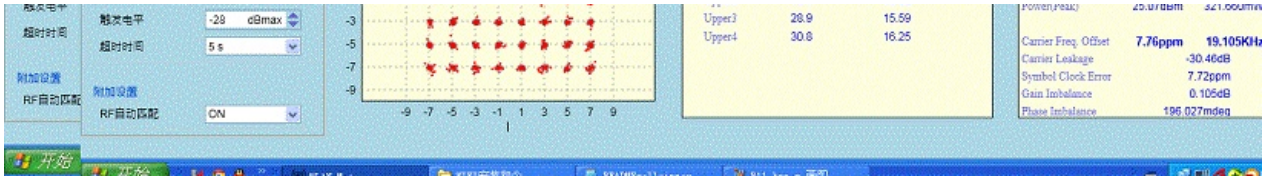
AP 6212 wifi 802.11 B test report


WLAN Meter
Version:2.5.2.11
WLAN Test Solution
Spectrum
Power
IQ Signal
Symbol Const
Spectrum Mask Margins
Result
Relative Frequency(MHz)
Time(us)
Power Level(dBm)
I&Q Signal
Center : 2.412 GHz
RBW : 100.000 KHz
Center : 2.442 GHz
RBW : 100.000 KHz
Center : 2.462 GHz
RBW : 100.000 KHz

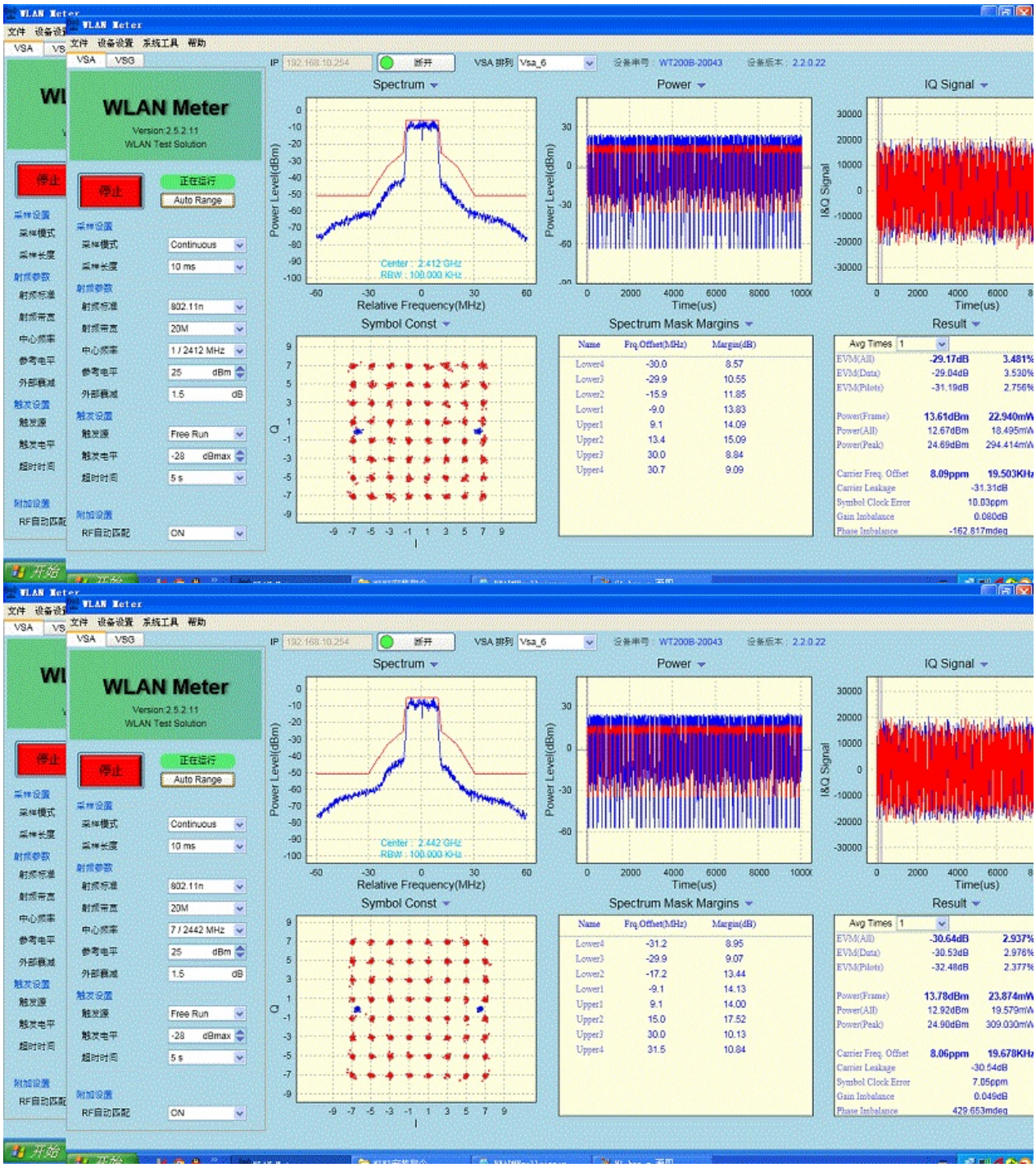


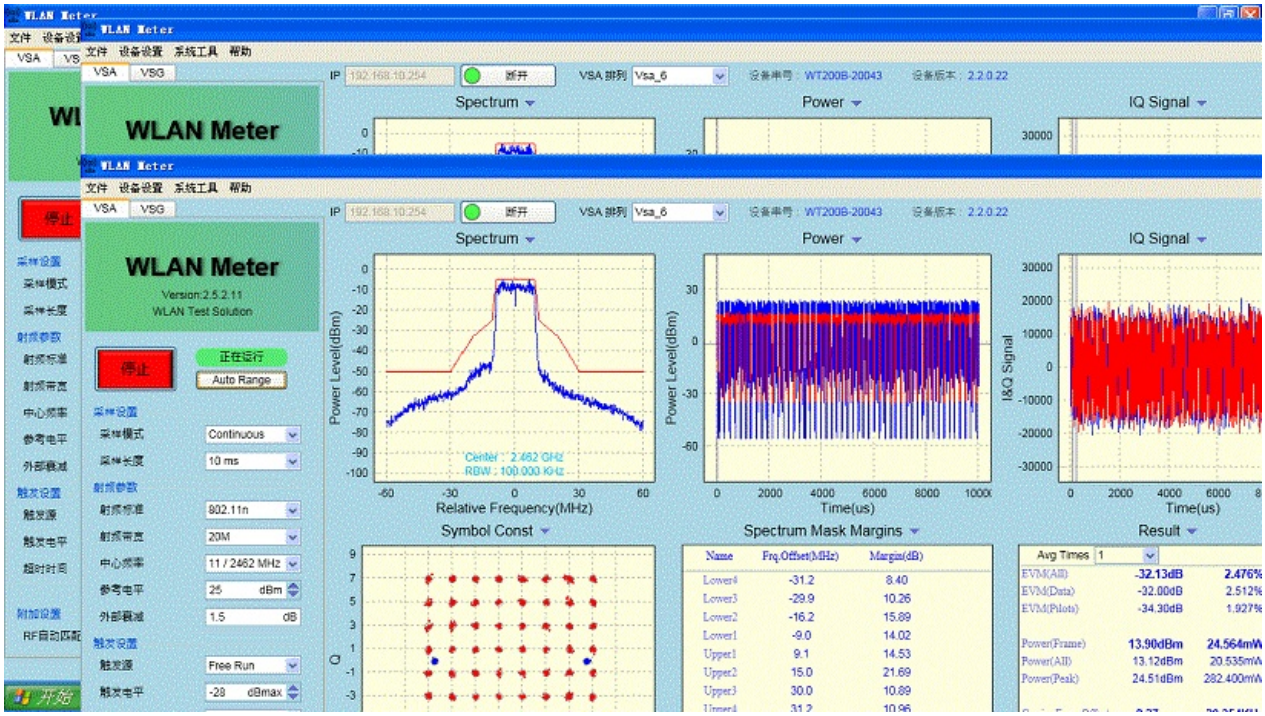
AP 6212 wifi 802.11 G test report


WLAN Meter
Version:2.5.2.11
WLAN Test Solution
Spectrum
Power
IQ Signal
Symbol Const
Spectrum Mask Margins
Result
Center : 2.412 GHz
RBW : 100.000 KHz
Center : 2.442 GHz
RBW : 100.000 KHz
Center : 2.462 GHz
RBW : 100.000 KHz
Relative Frequency(MHz)
Time(us)
Power Level(dBm)
I&Q Signal
Continuous
802.11a/g
20M
Free Run
Auto Range
正在运行



AP 6212 wifi 802.11 N test report




WLAN Meter
WLAN Meter
Version:2.5.2.11
WLAN Test Solution
Spectrum
Power
IQ Signal
Power Level(dBm)
Relative Frequency(MHz)
Time(us)
I&Q Signal
Symbol Const
Spectrum Mask Margins
Result
Name
Frq.Offset(MHz)
Margin(dB)
Lower4 -31.2 8.40
Lower3 -29.9 10.26
Lower2 -16.2 15.89
Lower1 -9.0 14.02
Upper1 9.1 14.53
Upper2 15.0 21.69
Upper3 30.0 10.89
EVM(All) -32.13dB 2.476%
EVM(Data) -32.00dB 2.512%
EVM(Pilots) -34.30dB 1.927%
Power(Frame) 13.90dBm 24.564mW
Power(All) 13.12dBm 20.535mW
Power(Peak) 24.51dBm 282.400mW

BPI-M2+ CE,FCC RoHS Certification