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About banana pi BPI-M64

Banana PI BPI-M64 is the open source hardware platform, Banana PI BPI-M64 is a quad-core 64 bit version of Banana Pi,use Allwinner A64 design, it support WIFI+BT on board.

Banana Pi BPI-M64 series run Android, Debian linux, Ubuntu linux,Raspbian image and other OS.

Banana PI PBI-M64 hardware: 64 Bit Quad Core ARM Cortex A53 1.2 Ghz CPU, 2GB DDR3 SDRAM, 8G eMMC flash on board

Banana PI BPI-M64 with Gigabit Ethernet port, It can run Android smoothly. The size of Banana PI BPI-M64 same as Banana Pi BPI-M3, support 1080P 4K video, the GPIO header is pin-compatible with Raspberry Pi.

The new BPI-M64 is a tiny little computer with great big ambitions. The expandable single-board device runs either Linux or Android and features impressive specs that outshine comparable products by a substantial margin. Highlights include a 1.2GHz quad-core ARM processor, a Mali 400 MP2 GPU, 2G of DDR3 RAM, a microSDXC slot,8G eMMC flash,WIFI&BT onboard and support for 4K ultra high-definition video.

More specs follow below.

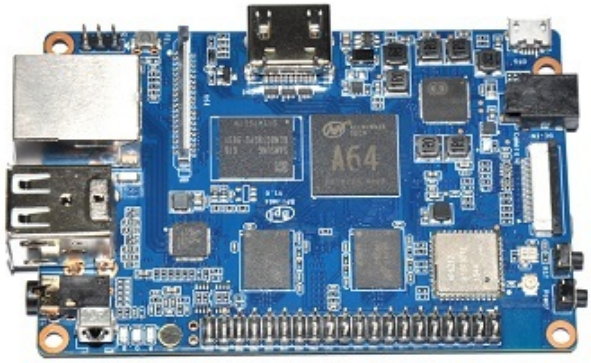
- 64 Bit Quad Core ARM Cortex A53 1.2 Ghz CPU
- Dual core Mali 400 MP2 GPU
- 2G DDR3 SDRAM
- MicroSD slot supports up to 256GB expansion
- 8G eMMC flash (option 16/32/64G)
- CSI camera intface and DSI display interface support
- 10/100/1000 Mb Ethernet port
- (3) USB 2.0 hosts and (1) USB otg port
- 4K high-definition video playback
- 4K x 2K HDMI port and multi-channel audio output
- WIFI&Bluetooth 4.0 with 802.11BGN onboard
- 3.5mm Stereo Output mini-jack with microphone support
- Built-in 3.7V Lithium Battery Charging Circuit
- Hardware security enables trustzone security system, Digital Rights Management (DRM), information encryption/decryption, secure boot, secure JTAG and secure efuse

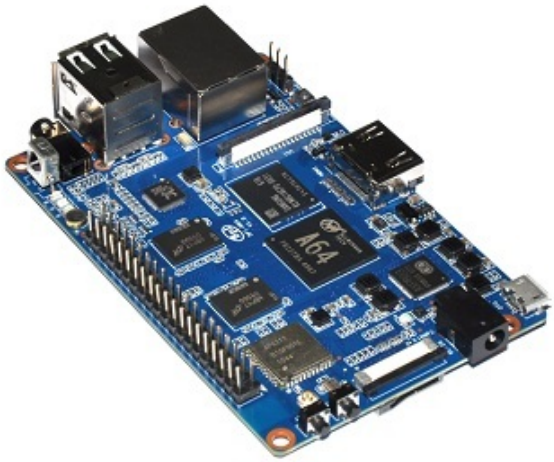
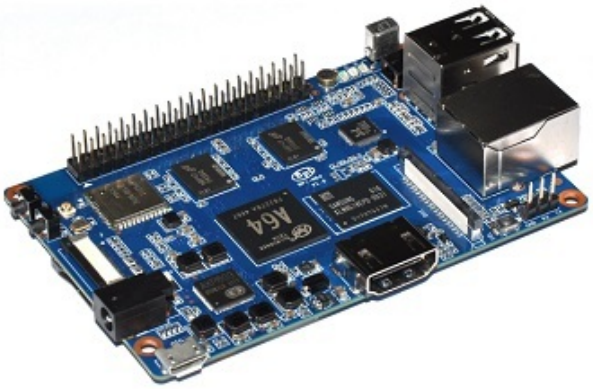
forum: http://www.banana-pi.org

forum: http://www.bananapi.com

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

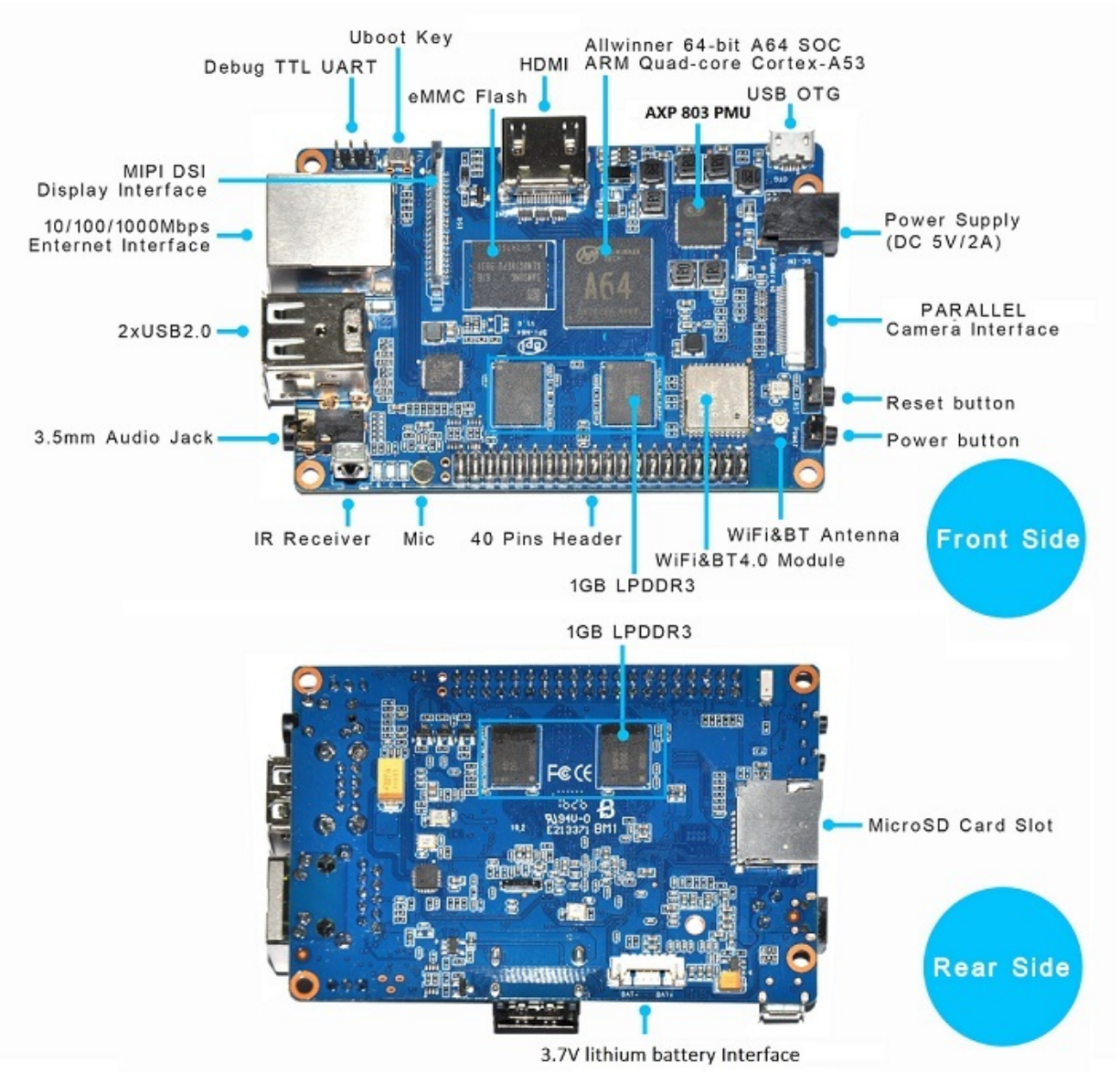
BPI-M64 hardware



Size is same as BPI-M3, so you can use BPI-M3 case for BPI-M64.

BPI-M64 hardware interface



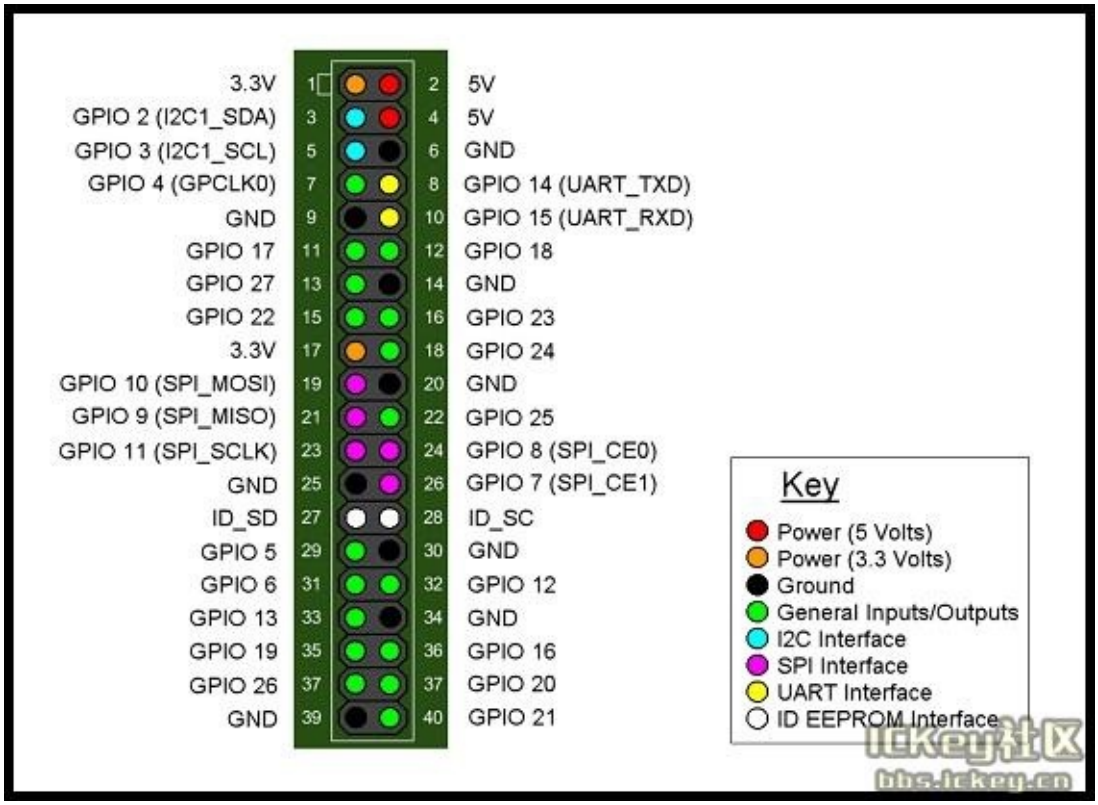
BPI-M64 hardware spec

Hardware Specification of Banana pi BPI-M64

Soc	Allwinner A64
CPU	1.2 Ghz Quad-Core ARM Cortex A53 64-Bit Processor. It has 64 and 32 Bit execution states for scalable high performance power – including a NEON Multimedia processing engine.
GPU	dual-core MALI-400 MP2 and runs at 500MHz, capable of 1.1 Gpixel/s throughput. Graphics capabilities are slightly higher than the original Xbox's level of performance. The GPU provides OpenGL ES 2.0, hardware-accelerated OpenVG, 4Kx2Kp30 H.265 decode, and 1080p60 H.264 high-profile encode and decode.
SDRAM	2GB DDR3 with 733MHz(shared with GPU)
Power	5V @ 2A via DC power
GPIO	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, eMMC 8G on board (option：16/32/64G)
Display	Supports multi-channel HD display: HDMI 1.4 (Type A - full),MIPI Display Serial Interface (DSI) for raw LCD panels,1.4 HDMI resolutions from 4K x 2K HDMI port
Video	Multi-format FHD video decoding, including Mpeg1/2, Mpeg4, H.263, H.264, etc H.264 decode up to 1080P60,H.265 decode up to 4KP30
Audio outputs	HDMI, analog audio (via 3.5 mm TRRS jack), I2S audio (also potentially for audio input)
Camera	A CSI input connector Camera:Supports 8-bit YUV422 CMOS sensor interface,Supports CCIR656 protocol for NTSC and PAL,Supports 5M pixel camera sensor ,Supports video capture solution up to 1080p@30fps
Audio input	On board microphone
USB	3 USB 2.0 host, 1 USB 2.0 OTG
Buttons	Reset button, Power button, U-boot button
Leds	Power status Led and RJ45 Led
IR	on board IR receiver
DC Power	5V/2A with DC port
battery	3.7V lithium battery power support
Sizes	92mm×60mm
Weight	45g

BPI-M64 GPIO Pin define

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:

GPIO Pin Name	Default Function	Function2：GPIO	Function3
CON2-P01	VCC-3V3		
CON2-P02	VCC-5V		
CON2-P03	TWI1-SDA	PH3	
CON2-P04	VCC-5V		
CON2-P05	TWI1-SCK	PH2	
CON2-P06	GND		
CON2-P07	PH6	PH6	
CON2-P08	UART2-TX	PB0	
CON2-P09	GND		
CON2-P10	UART2-RX	PB1	
CON2-P11	PH7	PH7	
CON2-P12	UART2-CTS	PB3	
CON2-P13	DMIC-CLK	PH10	
CON2-P14	GND		
CON2-P15	DMIC-DIN	PH11	

CON2-P16	UART2-RTS	PB2	
CON2-P17	VCC-3V3		
CON2-P18	PD4	PD4	
CON2-P19	SPI1-MOSI	PD2	UART4-TX
CON2-P20	GND		
CON2-P21	SPI1-MISO	PD3	UART4-RX
CON2-P22	PC0	PC0	
CON2-P23	SPI1-CLK	PD1	UART3-RX
CON2-P24	SPI1-CS	PD0	UART3-TX
CON2-P25	GND		
CON2-P26	PC2	PC2	
CON2-P27	PC4	PC4	
CON2-P28	PC3	PC3	
CON2-P29	PC7	PC7	
CON2-P30	GND		
CON2-P31	PCM0-BCLK	PB5	
CON2-P32	PCM0-DIN	PB7	
CON2-P33	PCM0-SYNC	PB4	
CON2-P34	GND		
CON2-P35	PCM0-DOUT	PB6	
CON2-P36	PL9	PL9	
CON2-P37	PL12	PL12	
CON2-P38	PL7	PL7	
CON2-P39	GND		
CON2-P40	PL8	PL8	

CSI Camera Connector specification:

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 “Camera”.

CSI Pin Name	Default Function	Function2：GPIO
CN5-P01	NC	
CN5-P02	GND	
CN5-P03	CSI0-SDA	PE13
CN5-P04	CSI0-AVDD	
CN5-P05	CSI0-SCK	PE12
CN5-P06	CSI0-Reset	PE16
CN5-P07	CSI0-VSYNC	PE3
CN5-P08	CSI0-PWDN	PE17
CN5-P09	CSI0-HSYNC	PE2
CN5-P10	CSI0-DVDD	
CN5-P11	CSI0-DOVDD	
CN5-P12	CSI0-D7	PE11
CN5-P13	CSI0-MCLK	PE1
CN5-P14	CSI0-D6	PE10
CN5-P15	GND	
CN5-P16	CSI0-D5	PE9
CN5-P17	CSI0-PCLK	PE0
CN5-P18	CSI0-D4	PE8
CN5-P19	CSI0-D0	PE4
CN5-P20	CSI0-D3	PE7
CN5-P21	CSI0-D1	PE5
CN5-P22	CSI0-D2	PE6
CN5-P23	GND	
CN5-P24	CSI0-AFVCC	

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	
CN6-P02	IPSOUT	
CN6-P03	VCC	
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	
CN6-P15	NC	
CN6-P16	GND	
CN6-P17	TWI0-SDA	PH1
CN6-P18	DSI-D1N	
CN6-P19	TWI0-SCK	PH0
CN6-P20	DSI-D1P	
CN6-P21	CTP-INT	PH4
CN6-P22	GND	
CN6-P23	CTP-RST	PH8
CN6-P24	DSI-CKN	
CN6-P25	GND	
CN6-P26	DSI-CKP	
CN6-P27	LCD-BL-EN	PD5
CN6-P28	GND	
CN6-P29	LCD-RST	PD6
CN6-P30	DSI-D2N	
CN6-P31	LCD-PWR-EN	PD7
CN6-P32	DSI-D2P	
CN6-P33	GND	
CN6-P34	GND	
CN6-P35	LCD-PWM	PL10
CN6-P36	DSI-D3N	
CN6-P37	GND	
CN6-P38	DSI-D3P	
CN6-P39	NC	
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	

BPI-M64 micro SD card slot

BPI-M64 have support a micro SD card slot. you can burn image to micro SD card ,and can burn image to SD card , use it boot BPI-M64 same as raspberry pi.

Note:

- support 8G 16G 32G 64G
- please choose class 10 TF card for banana pi.

BPI-M64 GigE LAN

Banana PI BPI-M64 with one Gigabit ethernet port,use RTL8211E chip on board.same as BPI-M3

BPI-M64 eMMC flash

BPI-M64 have support 8G eMMC flash on board by defaults.

also can support 4-64G eMMC for option:

test 64G eMMC flash on BPI-M3, same way can rework on BPI-M64

http://forum.banana-pi.org/t/replace-the-on-board-8g-emmc-with-64g-emmc-including-some-test-results/1432

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-M64 microSD card slots.

BPI-M64 WIFI interface

BPI-M64 support AP6212 wifi module on board. it support 802.11/b/g/n wifi & BT4.0

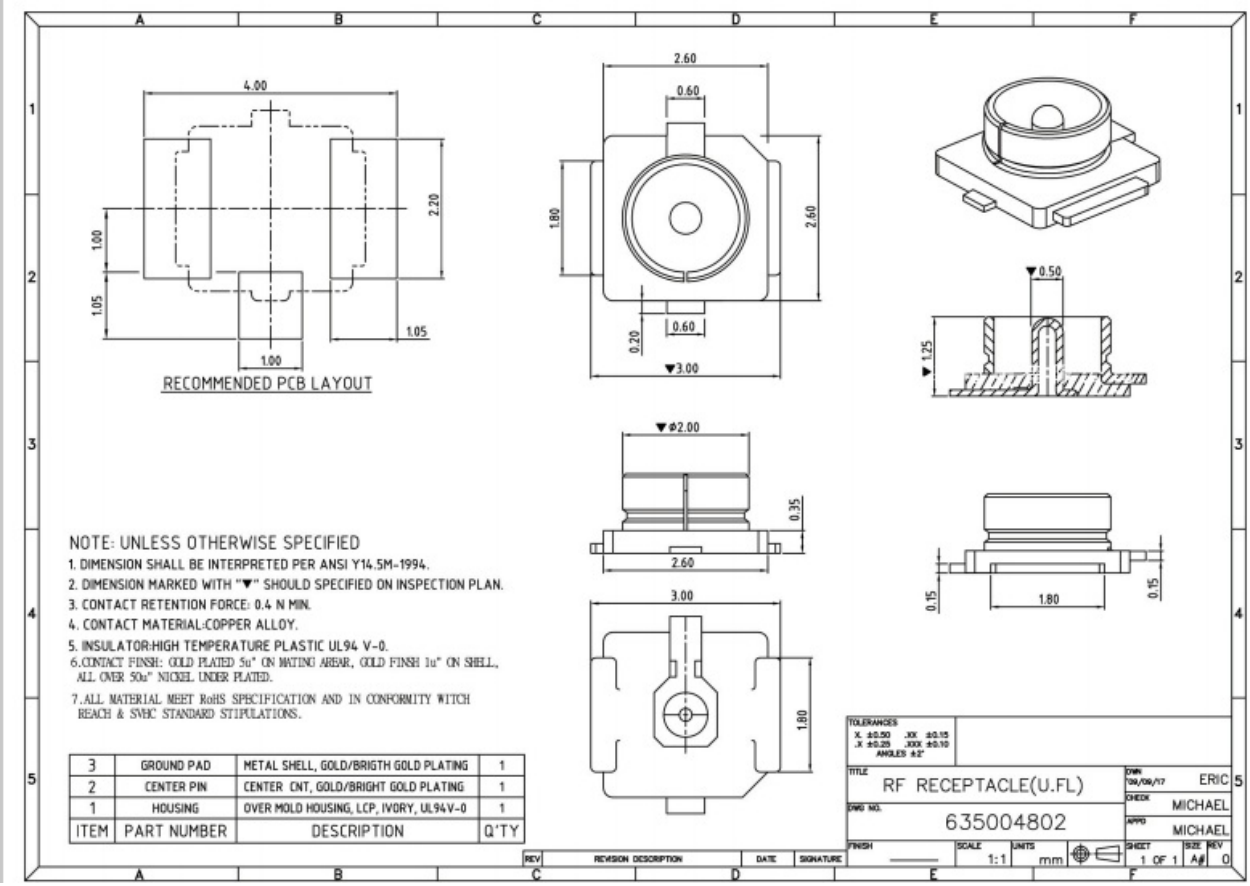
BPI-M64 wifi antenna slot

banana pi BPI-M64 have support ap6212 wifi&BT module onboard

BPI-M64 have wifi antenna on board

if you want use a extend antenna for bpi-M64, you can add by youself.

wifi extend antenna slot:



BPI-M64 bluetooth interface

BPI-M64 have AP6212 WiFi&Bluetooth on baord. it support bluetooth function by defaults.

BPI-M64 HDMI interfact

BPI-M64 has a standard HDMI 1.4 interface. so We can use HDMI-to-HDMI cable to connect BPI-M64 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-M64 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-M64

BPI-M64 CSI camera interface

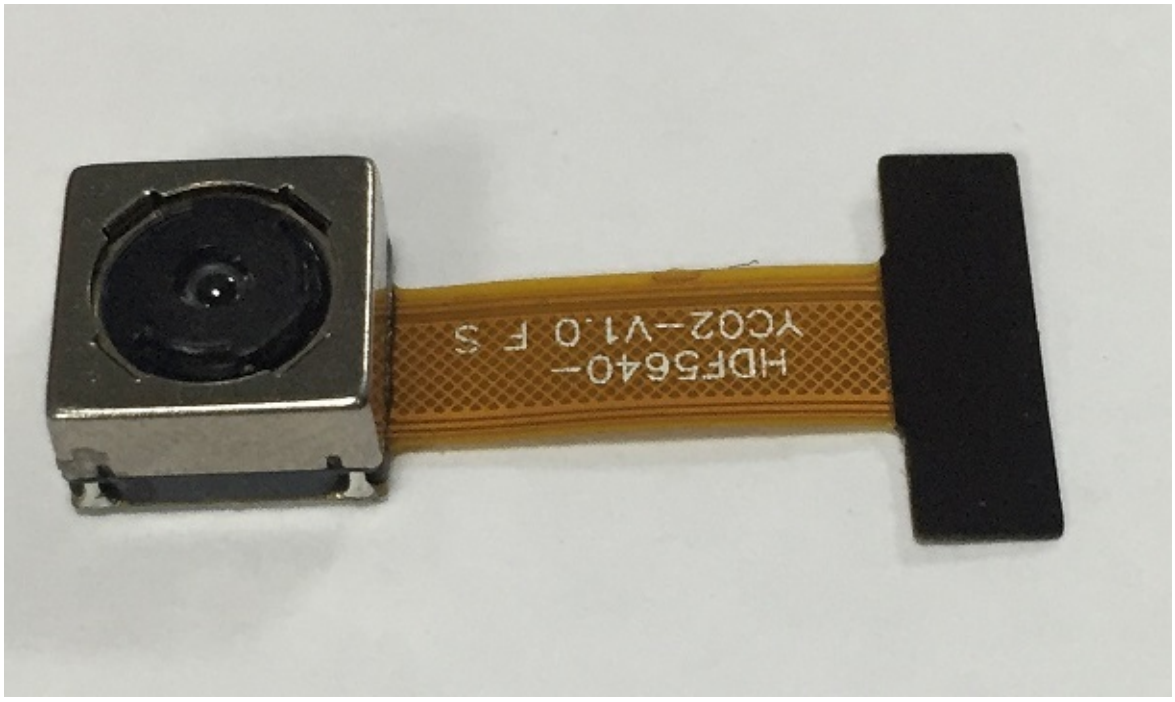
connect external camera module with proper signal pin mappings. The pin definitions of the CSI interface are shown as below. This is marked on the Banana Pi board as “CSI″.

CSI pin define:

please see: BPI-M64 GPIO pine define

BPI-M64 CSI camera accessories

note: for BPI-M64 , camera is same as BPI-M2+, it support OV5640 module, not need extend board. you just can direct use OV5640 modue on CSI interface.



OV5640 driver:

This is my modified OV5640 driver for the CMOS camera that incorporates many image resolutions and/or image quality. You can take advantage of a higher FPS, Image Quality (Preview or Capture) or Window size, choosing the one that best fit your needs.

This is expected to work with reasonable quality for AW platform (32 bit and 64 bit).

Working window sizes and expected FPS (preview mode)

- QSXGA: 2592x1936 (7.5 FPS)
- QXGA: 2048x1536 (7.5 FPS)
- 1080P: 1920x1080 (7.5 FPS, 15 FPS)
- UXGA: 1600x1200 (7.5 FPS, 15 FPS)
- UXGA: 1280x960 (7.5 FPS, 15 FPS)
- 720P: 1280x720 (7.5 FPS, 15 FPS)
- XGA: 1024x768 (7.5 FPS, 15 FPS)
- SVGA: 800x600 (15 FPS, 30 FPS)
- VGA: 640x480 (15 FPS, 30 FPS)
- QVGA: 320x240 (30 FPS)
- QCIF: 176x144 (30 FPS with some artifacts)

The OV5640 has been updated to work on M64 (https://github.com/avafinger/ov5640/tree/A64)

from Alex of camera developer., thank Alex do this cool work.

BPI-M64 3.5 mm TRRS jack Audio interface

BPI-M64 support 3.5 mm TRRS jack Audio interface on board.

BPI-M64 Audio microphone interface

BPI-M64 support Audio microphone interface on board.

BPI-M64 IR interface

BPI-M64 support IR interface on board. you can use it as remote control.

BPI-M64 USB interface

BPI-M64 have two USB 2.0 interface on board.so you can connect Keyboard,mouse, USB camera and ... on BPI-M64

it also support another USB port ,but not with standard USB port. need use it with PIN.

so you can use total 3 USB port on board.

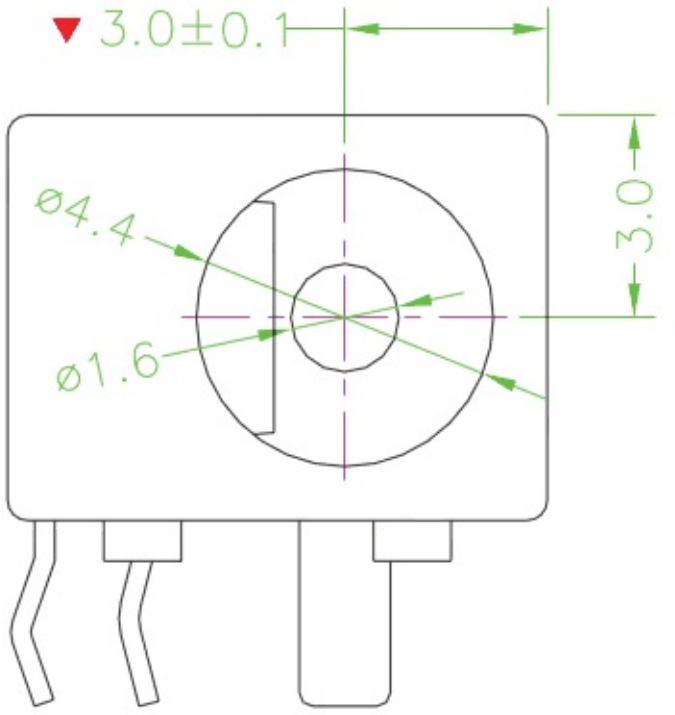
BPI-M64 OTG interface

banana pi BPI-M64 have 1 OTG port on board.

BPI-M64 DC Power interface

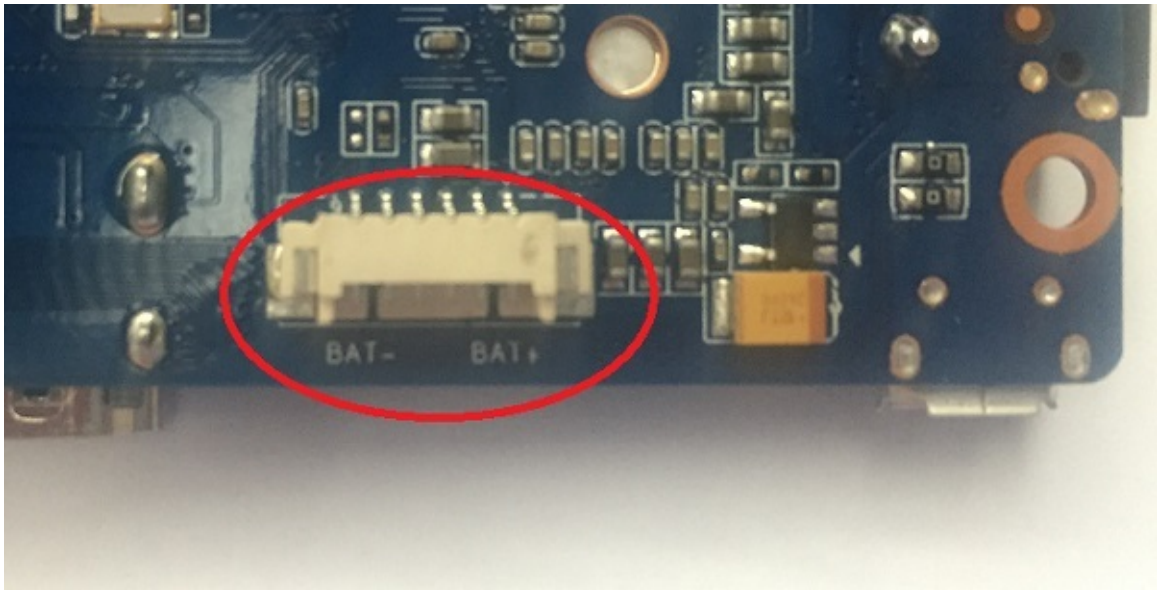
BPI-M64 power with DC port (default)

adapter same as BPI-M3



BPI-M64 power with microUSB power (option)

BPI-M64 3.7V lithium battery interface



you can use this interfact connect 3.7V lithium battery.

SCH:

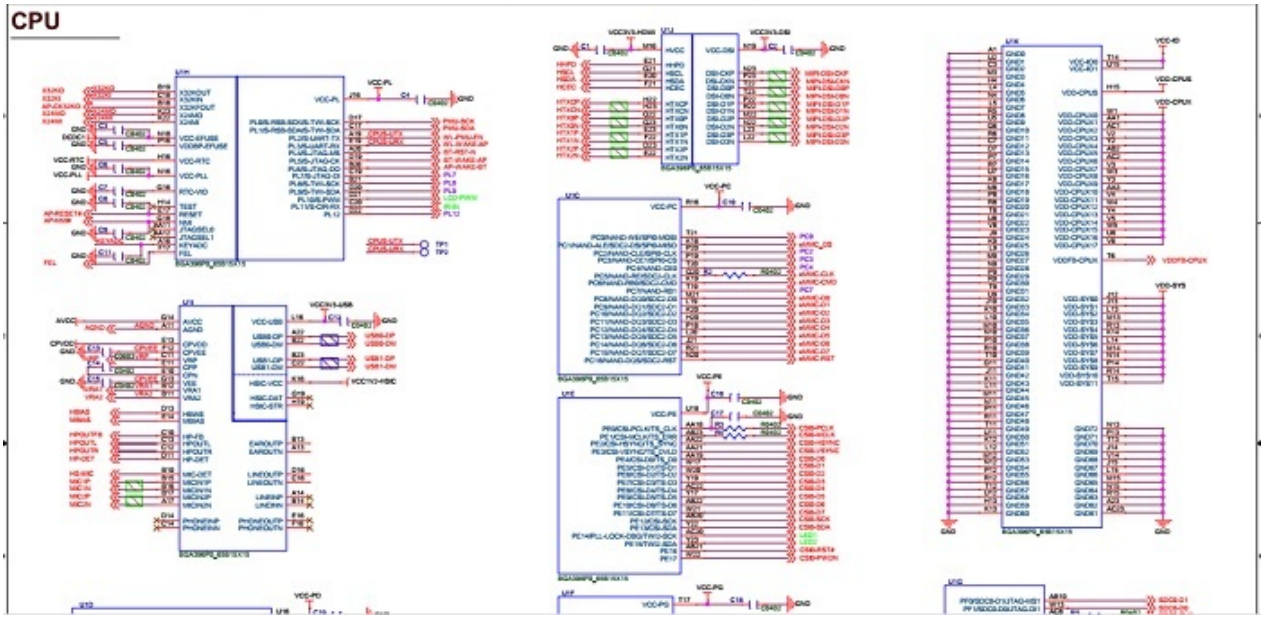
battery interface spec:

https://drive.google.com/file/d/0B4PAo2nW2KfnSmVuVDhQc0NLdG8/view?usp=sharing

BPI-M2 Ultra test 3.7V lithium battery interface with Ubuntu linux

Lithium battery discharge

BPI-M64 schematic diagram



BPI-M64 schematic diagram download link:

google driver:

https://drive.google.com/file/d/0B4PAo2nW2KfnUE5tMGItNkZjMzg/view?usp=sharing

baidu link:

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

BPI-M64 DXF and 3D design

Banana Pi BPI-M64 DXF file download:

https://drive.google.com/file/d/0B4PAo2nW2KfnajlEY0xsdjNxY3c/view?usp=sharing

BPI-M64 software

banana pi BPI-M64 support Android 5.1.1 android 6.0 and linux

we will update more image on our website .

if any user have build youself image ,please share it.

BPI-M64 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	5V/2A DC power adapter	A good quality, DC 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-M64, 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.

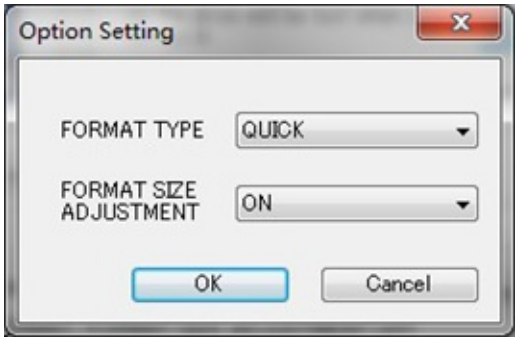
2.Format the SD card.

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.

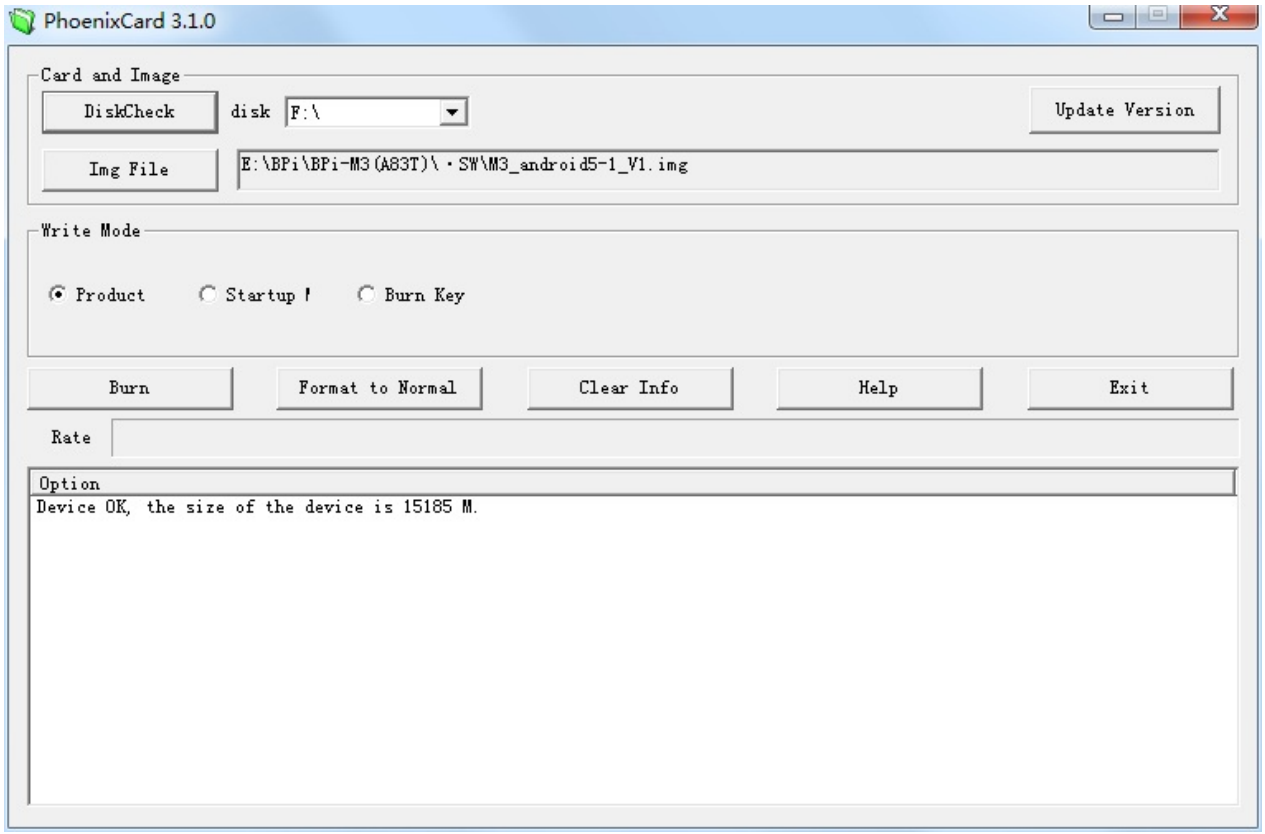
5.Write the image file to the SD card.

Android image

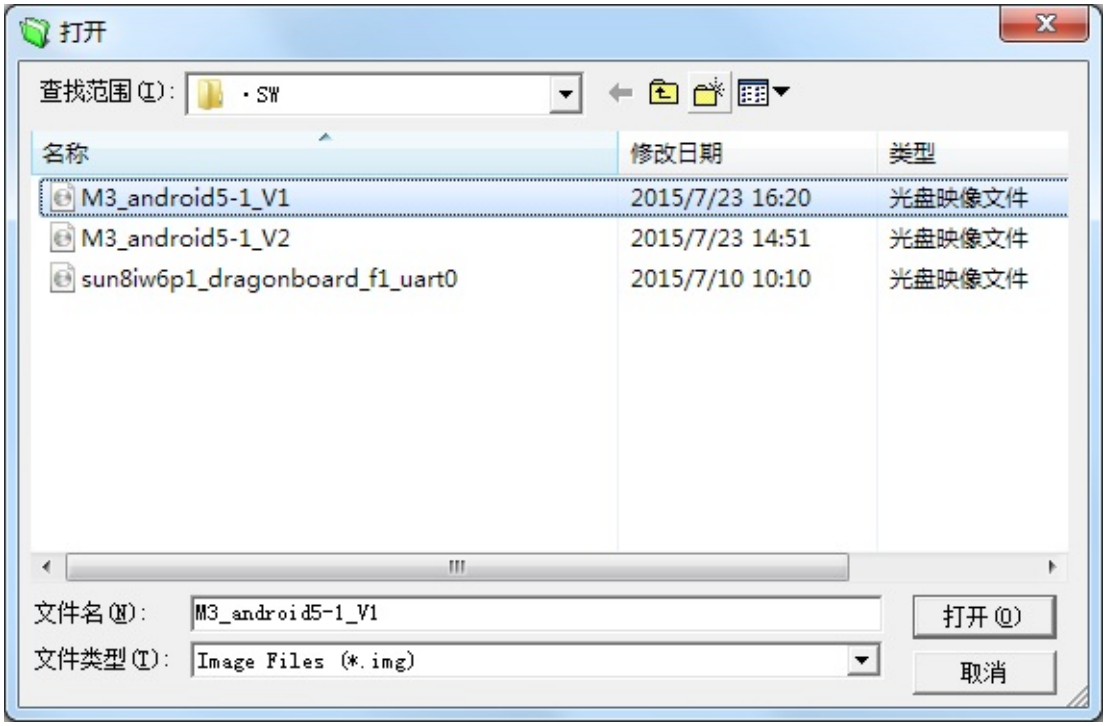
5.1 You need to use Phoenix Card to make the SD card. Download the Phoenix Card from

https://drive.google.com/open?id=0BzoTh3Vdt47ffi1Id0RuWXhUVzdYdjFjaHEtMlNQWVFTRmlxcC1OQnczSTV6OGRZWGpINU0

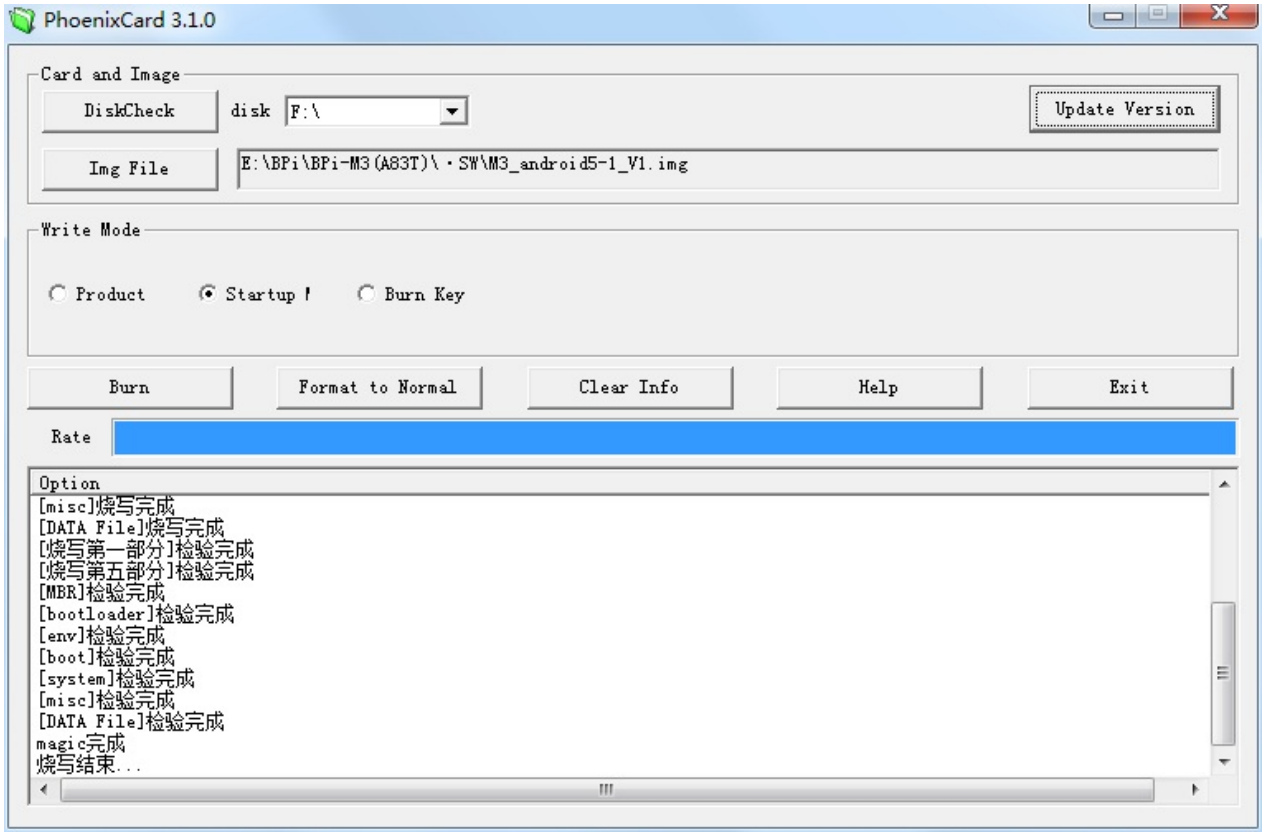
5.2 Run PhoenixCard.exe, Press “Disk Check” and select disk of SD Card.



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



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

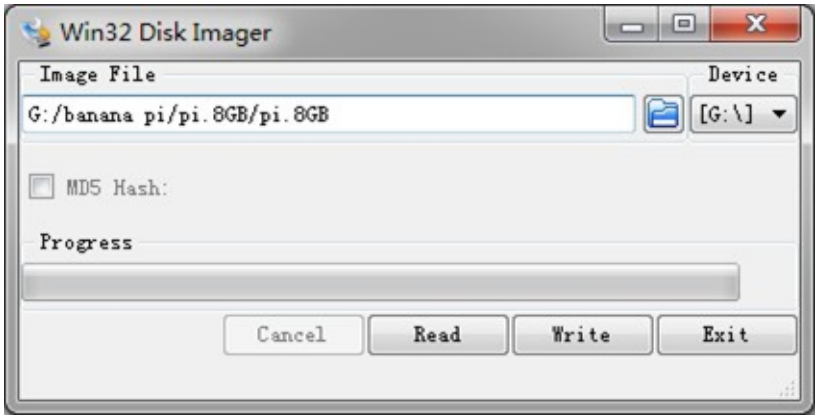


Linux image:

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 BPI-M64

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!

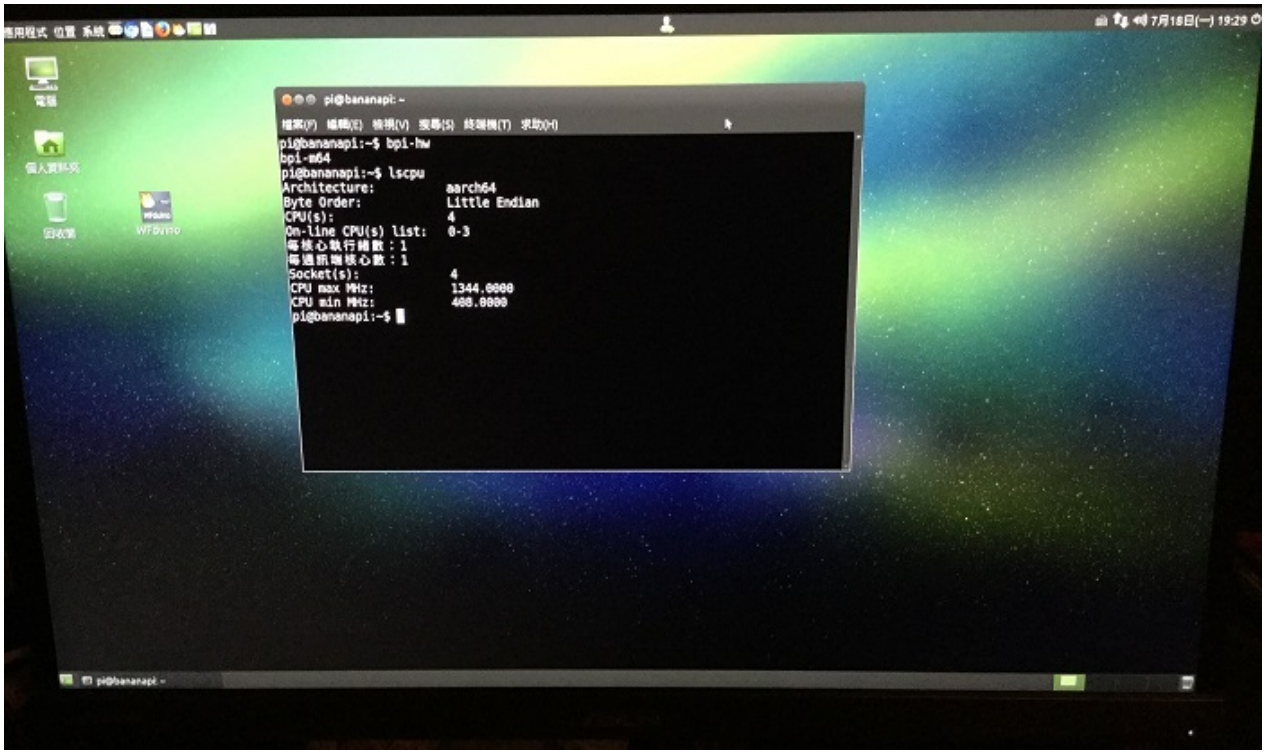
If all goes well, the Banana Pi will boot in a few minutes. The screen will display the OS GUI.

Linux software

Linux image for BPI-M64

BPI-M64 new image:edu-ubuntu-mate-1604-preview-bpi-m64.img 2016-07-19

2016-07-19-edu-ubuntu-mate-1604-preview-bpi-m64.img.zip



1. based on ubuntu 16.04 mate from bpi-m3-mate (http://opensource.ntpc.edu.tw/)
2. BPI-M64 kernel 3.10.101
3. username & password: pi/bananapi , root/bananapi
4. support HDMI
5. support eMMC
6. support GMAC
7. support bpi-bootsel cmd can switch to (bpi-m64 & bpi-m3 & bpi-m2 & bpi-m2p & bpi-m1-m1p-r1)
8. support boot.scr (boot.cmd) to fatload dtb & Image & Initrd
9. kernel 3.10.101 (based on armbian's build), thanks for armbian (http://www.armbian.com)
10. github from https://github.com/igorpecovnik/lib by armbian's work
11. special thanks for Simon Eisenmann's work (https://github.com/longsleep)
12. special thanks for linux-sunxi's work (https://linux-sunxi.org)
13. thanks for pine64.org's work (http://wiki.pine64.org)
14. support nodejs
15. support node-red
16. included many apps for edu
17. support scratch 2 online with scratchx
18. special thanks to the team of http://opensource.ntpc.edu.tw/

info: need >= 16GB SD and not use for eMMC(8GB)

Google Drive: https://drive.google.com/file/d/0B_YnvHgh2rwjSTQ5V2ItMXlEeVE/view?usp=sharing

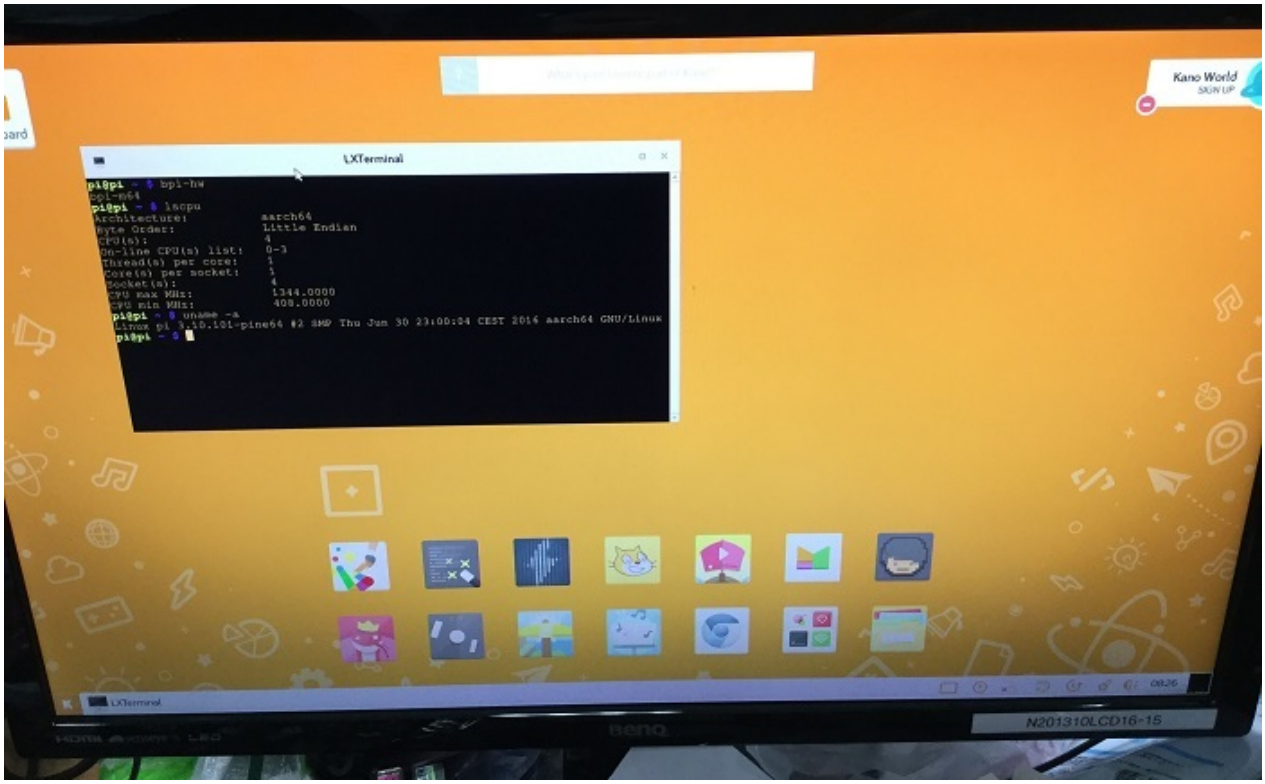
MD5: e7cf0c03baa2e7d6c49e4744ed4d1095

discuss on forum:

http://forum.banana-pi.org/t/bpi-m64-new-image-edu-ubuntu-mate-1604-preview-bpi-m64-img-2016-07-19/2044

BPI-M64 new image:Kanux-Beta-3.3.0-preview-bpi-m64.img 2016-07-15

2016-07-15-Kanux-Beta-3.3.0-preview-bpi-m64.img.zip



1. based on KANO OS Beta 3.3.0 (support rpi3 rpi2 rpi1)
2. BPI-M64 kernel 3.10.101
3. username & password: pi/bananapi , root/bananapi
4. support HDMI
5. support eMMC
6. support GMAC
7. support bpi-bootsel cmd can switch to (bpi-m64 & bpi-m3 & bpi-m2 & bpi-m2p & bpi-m1-m1p-r1)
8. support boot.scr (boot.cmd) to fatload dtb & Image & Initrd
9. kernel 3.10.101 (based on armbian's build), thanks for armbian (http://www.armbian.com)
10. github from https://github.com/igorpecovnik/lib by armbian's work
11. special thanks for Simon Eisenmann's work (https://github.com/longsleep)
12. special thanks for linux-sunxi's work (https://linux-sunxi.org)
13. thanks for pine64.org's work (http://wiki.pine64.org)
14. thanks for Kano Developers's work(http://developers.kano.me/downloads/)
15. thanks for raspberry.org's work

Google Drive: https://drive.google.com/file/d/0B_YnvHgh2rwjYzNWWER4a3h4LWs/view?usp=sharing

MD5: 6b7e0eadb85459b3e3a6ef1f9ec36a08

BPI-M64 new image ：raspbian-jessie-bpi-m64.img 2016-

07-13

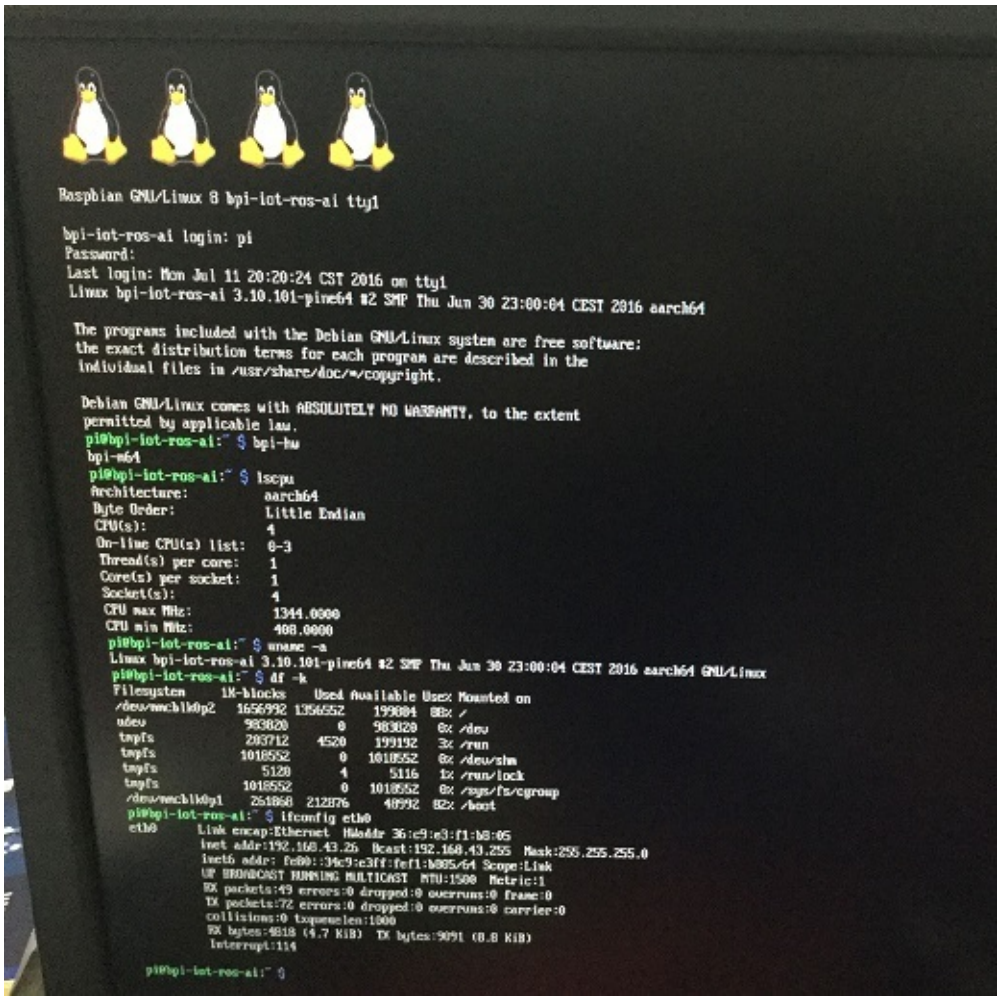
2016-07-13-raspbian-jessie-bpi-m64.img.zip

1. based on RASPBIAN JESSIE 2016-05-27(support rpi3 rpi2 rpi1)
2. BPI-M64 kernel 3.10.101
3. username & password: pi/bananapi , root/bananapi
4. support HDMI
5. support eMMC
6. support GMAC
7. support bpi-bootsel cmd can switch to (bpi-m64 & bpi-m3 & bpi-m2 & bpi-m2p & bpi-m1-m1p-r1)
8. support boot.scr (boot.cmd) to fatload dtb & Image & Initrd
9. kernel 3.10.101 (based on armbian's build), thanks for armbian (http://www.armbian.com)
10. github from https://github.com/igorpecovnik/lib by armbian's work
11. special thanks for Simon Eisenmann's work (https://github.com/longsleep)
12. special thanks for linux-sunxi's work (https://linux-sunxi.org)
13. thanks for raspberry.org's work(https://www.raspberrypi.org/downloads/raspbian)
14. thanks for pine64.org's work (http://wiki.pine64.org)

Google Drive: https://drive.google.com/file/d/0B_YnvHgh2rwjb3VqQTczVDBFSnM/view?usp=sharing

MD5: 9be9064dd74c5faad98aed75e7cd39b6

2016-07-12-raspbian-lite-preview-bpi-m64.img.zip



1. based on RASPBIAN JESSIE LITE 2016-05-27(support rpi3 rpi2 rpi1)
2. BPI-M64 kernel 3.10.101
3. username & password: pi/bananapi , root/bananapi
4. support HDMI
5. support eMMC
6. support GMAC
7. support bpi-bootsel cmd can switch to (bpi-m64 & bpi-m3 & bpi-m2 & bpi-m2p & bpi-m1-m1p-r1)
8. support boot.scr (boot.cmd) to fatload dtb & Image & Initrd
9. kernel 3.10.101 (based on armbian's build), thanks for armbian (http://www.armbian.com)
10. github from https://github.com/igorpecovnik/lib by armbian's work
11. special thanks for Simon Eisenmann's work (https://github.com/longsleep)
12. special thanks for linux-sunxi's work (https://linux-sunxi.org)
13. thanks for raspberry.org's work(https://www.raspberrypi.org/downloads/raspbian)
14. thanks for pine64.org's work (http://wiki.pine64.org)

Google Drive: https://drive.google.com/file/d/0B_YnvHgh2rwjNmQwUi1Ia2RuRkk/view?usp=sharing

MD5: 9e063b9bb7373f09c918f1516dd5b759

Android software

[BPI-M64] New image: Android 6.0 (Vsersion:V2) 2017-1-4

HDMI-Version

Google Drive:

https://drive.google.com/open?id=0B_YnvHgh2rwjcGVfMXF1TGptRVk

Baidu Cloud:

https://pan.baidu.com/s/1eS3KmOy

MD5: 7149885efd591985315d5c309f870fdc

LCD-Version

Google Drive:

Baidu Cloud:

MD5:

Release Note:

1. Android 6.0 optimized
2. Installed Google Service

[BPI-M64] New image: Android 6.0 (Vsersion:V1) 2016-9-19

HDMI-Version

Google Drive:

https://drive.google.com/file/d/0B_YnvHgh2rwjc3ktSmlIdnhlTmc/view

Baidu Cloud:

https://pan.baidu.com/s/1nvTiEN3

MD5: acb8bbe57e133906021d27d24f9f7bf8

LCD-Version

Google Drive:

https://drive.google.com/file/d/0B_YnvHgh2rwjaVpFUlc0RHM5ajg/view

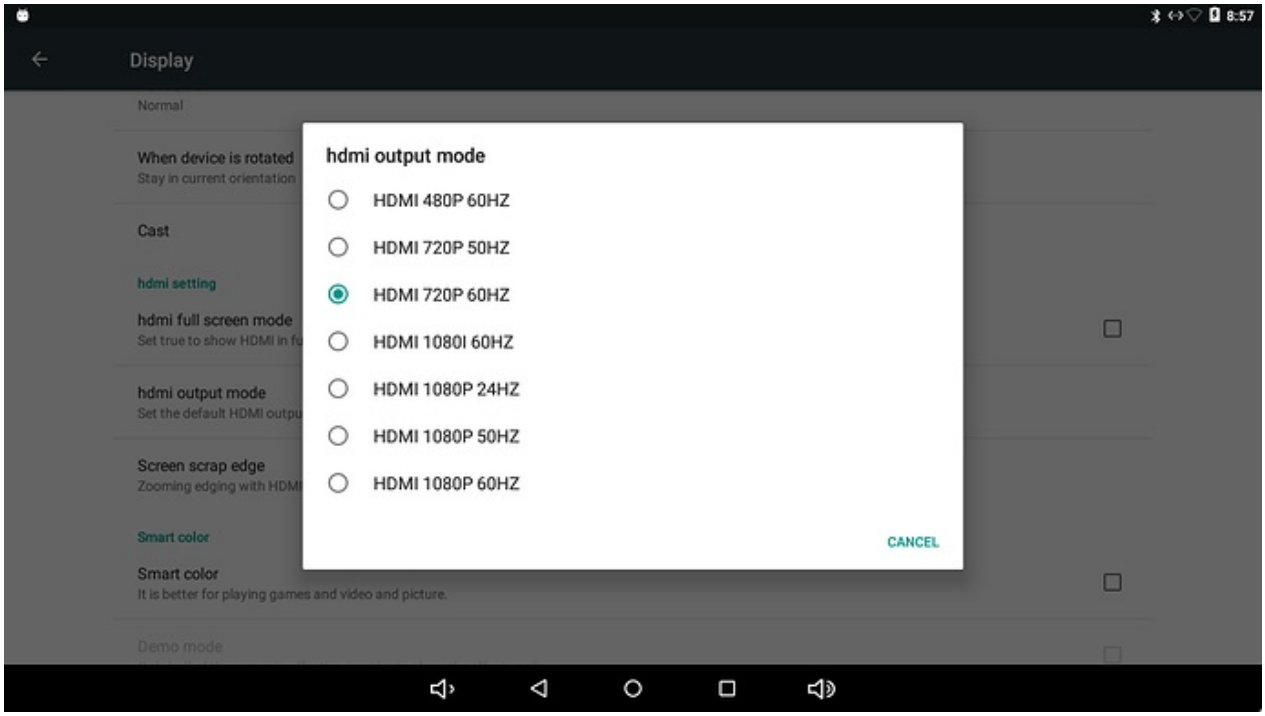
Baidu Cloud:

http://pan.baidu.com/s/1kV4Ql3h

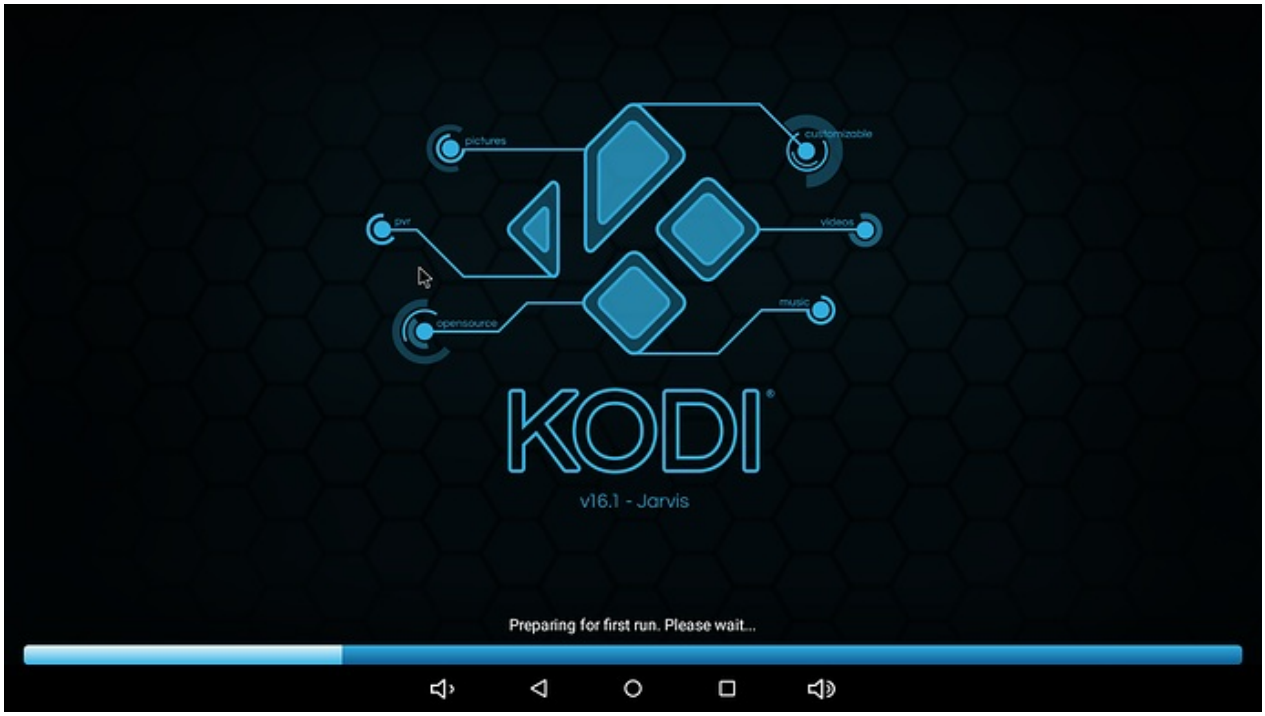
MD5: f084f0ff4c0e85e919de10f1e3efa07a

Release Note:

1. WIFI-Hotspot feature supported
2. Muti-Resolution feature supported (HDMI version only)
3. USB Camera (Uvcvideo supported)
4. Static IP feature supported
5. GMAC supported
6. WIFI 802.11 b/g/n supported
7. Bluetooth 4.0 supported
8. Preinstall Kodi V16.1 APP
9. Android root feature supported
10. GPIO control feature supported



Support KODI



online video memo:

https://www.youtube.com/watch?v=8LvugoctvBY

How to Install GApps to Android 6 on eMMC from Ubuntu

Video demo on youtube:

https://www.youtube.com/watch?v=2KCDws9CzWY

Prerequisite:

1. you must have already done the "How to Flash Android to eMMC from Ubuntu" http://forum.banana-pi.org/t/how-to-flash-android-to-emmc-from-ubuntu/2477/2
2. you must be able to boot into Android 6 on your BPi-M64 already.

Download: I have prepared a set of open gapps easy for you to push to the /system folder

https://pan.baidu.com/s/1slkytYl

google driver:

https://drive.google.com/open?id=0B_YnvHgh2rwjOEdDWGpSdy1xSDQ

Install:

1. make sure your BPi-M64 is power connected and also USB OTG connected to your PC.
2. double check if your usb is connected by typing:

```
adb devices
```

3. if it shows one long unique id number under the List of devices means you are connected and ready to go.
4. type the following:

```
adb root
adb remount
adb shell "rm -rf system/priv-app/PackageInstaller"
```

5. unzip the gapps.tar.gz file you have just downloaded.
6. cd gapps
7. inside gapps folder, you should see only 1 system folder, then type:

```
adb push system /
adb shell "pm grant com.google.android.gms android.permission.ACCESS_COARSE_LOCATION"
adb shell "pm grant com.google.android.gms android.permission.ACCESS_FINE_LOCATION"
adb shell "pm grant com.google.android.setupwizard android.permission.READ_PHONE_STATE"
adb shell "pm grant com.google.android.setupwizard android.permission.READ_CONTACTS"
adb reboot
```

after reboot, ignore any "unfortunately ... has stopped" message if got any... and please don't rush to open the apps yet, else it will cache the error and make things more complicated.

Fix Errors via Settings:

1. go to Settings->Apps
2. go into all the newly installed google apps, and go into the permissions, allow all of it that it suggest you to enable.
3. double check if any google apps that you miss adding the permissions.
4. reboot again by typing:

```
adb reboot
```

5. done!

if you didn't listen and rushed to open apps before fixing the permissions, you will have to go to Settings->Apps->top right corner menu choose "Reset app preferences", then reboot, and then go fix the permissions first, then reboot, then it should be ok.

How to test GPIO pins on Android

To test GPIO on Android with your newly acquired BPI-M64

Prepare the test LED by following the pic below:

Red connect to PB0 (pin 8)

Black connect to GND (pin 6)

then...

1，connect the microUSB OTG cable to your PC.

2，power up and wait till it boot into the Android Welcome screen.

3， make sure you are connected and have proper full access to the device by following the adb commands below:

```
adb devices
adb root
adb remount
adb shell
```

4， after inside the shell type the following and press enter:

```
setenforce 0
```

5， connect the LED like in the picture. always connect the GND(black) first,

6， type the following and enter, the LED will power on and light up:

```
echo 1 > /sys/class/gpio_sw/PB0/data
```

7， to power off

```
echo 0 > /sys/class/gpio_sw/PB0/data
```

BPI-M64 Android 6.0.1 source code

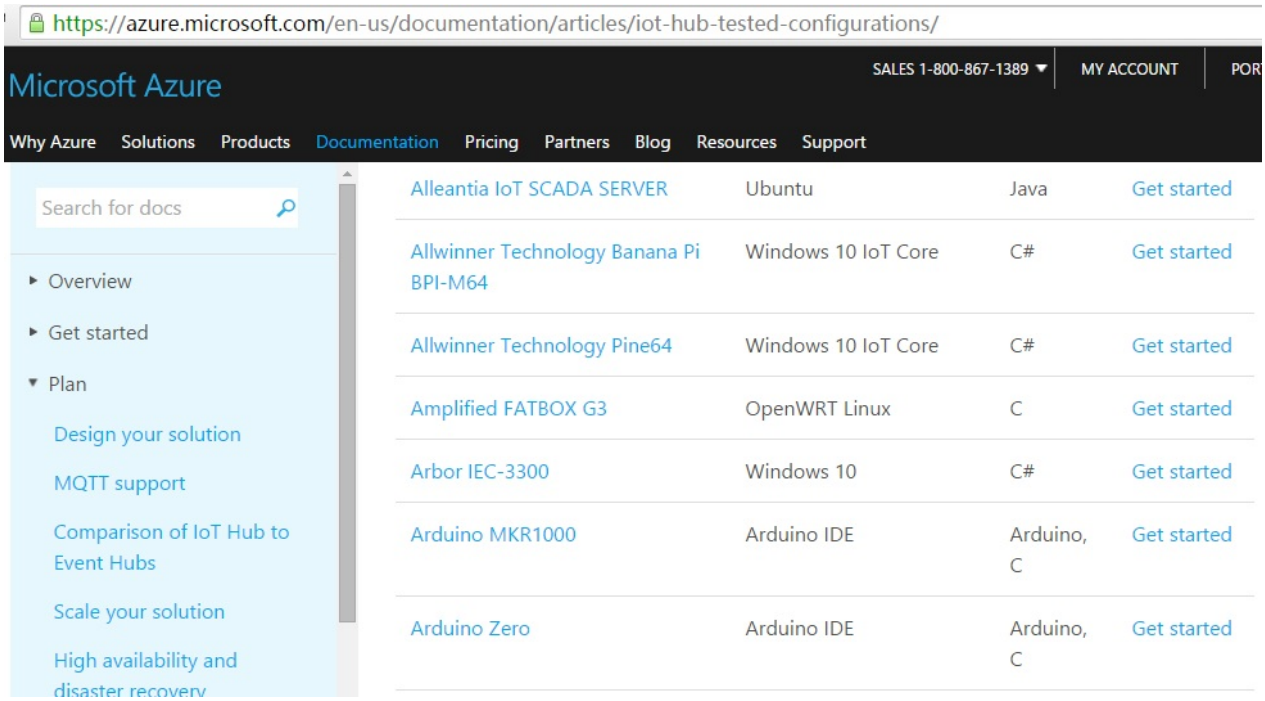
google driver link:

https://drive.google.com/open?id=0B_YnvHgh2rwjaVVMSi1xU1ZOY2c

thank taili share this code.

Banana pi BPI-M64 Win10 IoT

banana pi BPI-M64 IOT certifying pass by Microsoft:windows 10 iot core

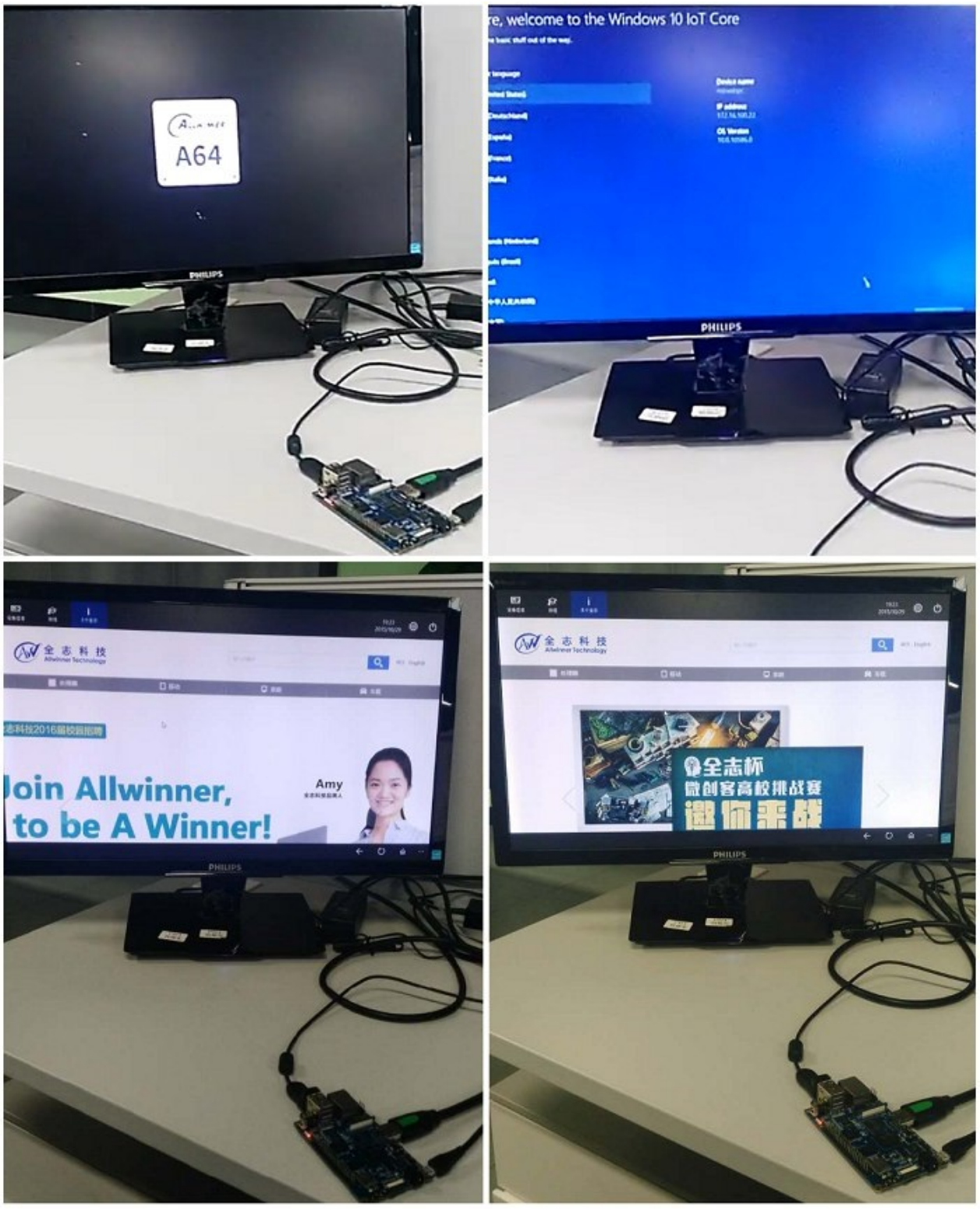


link: https://azure.microsoft.com/en-us/documentation/articles/iot-hub-tested-configurations/

get start:

https://github.com/Azure/azure-iot-sdks/blob/master/doc/get_started/windows10-iot-core-banana-pi-bpi-m64-csharp.md

test on BPI-M64



discuss on forum:

http://forum.banana-pi.org/t/banana-pi-bpi-m64-iot-certifying-pass-by-microsoft-windows-10-iot-core/2090

Win 10 IoT image

BPI-M64 new image :BPI-M64_Win10IoTCore_beta0.2 2017-1-13

http://pan.baidu.com/s/1c2ce100

BPI-M64 new image :BPI-M64_Win10IoTCore10586_beta0.1

download link:

https://drive.google.com/open?id=0B_YnvHgh2rwjODJOSS1TdkRvcEk

baidu link:

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

MD5: 1c09118cd45bf0c3b61d1846710a3649

Win 10 IoT Source code on github

Windows 10 IoT Core for BPI-M64 Release Note

The Unified Extensible Firmware Interface (UEFI]) is a specification that defines a software interface between an operating system and platform firmware. UEFI replaces the Basic Input/Output System (BIOS) firmware interface originally present in all IBM PC-compatible personal computers

AllWinner UEFI Firmware Release Notes

This document describes how to build AllWinner UEFI Firmware and bring a AllWinner dev board up with it. The AllWinner UEFI Firmware, as the major boot system for AllWinner-Windows platform, is based on the EDK2 framework which is open-source and with some AllWinner platform software packages injected.

Features of this version:

This version can only support two boards based on AllWinner A64 platform which is Pine64 and Banana Pi M64; Need to build and pack the firmware via a Linux shell; At present, it can only bring up Windows 10 IoT Core. About UEFI and EDK2 open source project, please refer to links below:

https://github.com/Leeway213/WinIoTBoot4

https://github.com/Leeway213/Win10-IoT-for-A64-Release-Notes/blob/master/20160809/BPI-M64/ReleaseNotes.md

UEFI Images:

https://github.com/Leeway213/Win10-IoT-for-A64-Release-Notes/tree/master/UEFIImage

BPI-M64 Reference documents

Main features of Allwinner A64 includes:

64-bit Cortex-A53 architecture Supports H.265/H.264 video decoding in hardware, and supports HDMI 4K display Supports various DDR memory types, making the BOM cost more competitive Supports eMMC 5.0 for better IO performance and enhanced data throughput capacity Allwinner’s exclusive patented SmartColor display technology, delivering more vivid and eye-pleasing visual experience Supports the latest Trusted Firmware security architecture from ARM

As the first design house in China that have distributed Android 5.0 Lollipop to its tablet lineup, Allwinner Technology will keep the momentum and release Android 5.0 to Allwinner A64 when it comes out. It’s also worthy of notice that the Linux kernel that Allwinner A64’s based on upgrades to the latest 3.10 version, perfectly matching with the 64-bit architecture and Android 5.0 operating system.

More details about Allwinner A64 are to be disclosed in the near future.

more about this chip, please see allwinner website:

http://www.allwinnertech.com/plus/view.php?aid=527

A64 chip documents

Allwinner A64 chip datasheet:

https://drive.google.com/file/d/0B4PAo2nW2KfnSW9lQnZ0d1RoVW8/view?usp=sharing

Allwinner A64 user’s manual (720 pages)

https://drive.google.com/file/d/0B4PAo2nW2KfnNHk4dkFJZEdqYXc/view?usp=sharing

A64 chip linux-sunxi wiki

The A64 is basically an Allwinner H3 with the Cortex-A7 cores replaced with Cortex-A53 cores (ARM64 architecture). They share most of the memory map, clocks, interrupts and also uses the same IP blocks. Differences between the H3 and the A64 seem to be: The H3 has three USB host controllers, whereas the A64 has only one. Both SoCs have an additional USB-OTG controller, which is assumed to be used as normal host controller as well. The H3 DRAM controller supports up to 2GB of RAM, the A64 supports up to 3 GB. Despite being a 64-bit chip, this makes the SoC entirely 32-bit on the physical side. The H3 supports 5 UARTs, the A64 has 6 of them. The MMC controller has been updated to support faster transfer modes. The MMC clocks have changed on the way, now the MMC controller itself provides support for the output and sample phase.

http://linux-sunxi.org/A64

BPI-M64 linux-sunxi wiki

https://linux-sunxi.org/Banana_Pi_M64

BPI-M64 quality guarantee

All the products Banana pi release go through strictly controlled process from developing,testing,manufacturing to certification.

We put quality first, users can mass produce their products using our boards directly, we've been dedicating to providing the most cost performance products.

BPI-M64 BT4.0 Lab test

Anritsu
BlueTest2 Test Report

Test Set Serial Number: 6K00006250
EUT Bluetooth Address: 983B16000000

Date: 2016/8/18
Time: 11:05:40

Overall Result: PASS

TRM/CA/01/C (Output Power)

Packet Length Tested: DH5

Hopping ON	Low	Med	High	Limits
Average Power	9.22 dBm	9.63 dBm	8.74 dBm	
Max Power	9.26 dBm	9.65 dBm	8.76 dBm	< 20.00 dBm
Min Power	9.21 dBm	9.62 dBm	8.72 dBm	> -6.00 dBm
Peak Power	9.49 dBm	9.93 dBm	9.03 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	9.20 dB	9.60 dB	8.80 dB	
Min Power	-21.10 dB	-21.40 dB	-23.40 dB	
Max Power Step	5.20 dB	5.30 dB	5.60 dB	<= 8.00 dB
Min Power Step	3.80 dB	3.90 dB	3.90 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	8.5 kHz	7.9 kHz	4.7 kHz	
Max Offset	13.2 kHz	12.2 kHz	13.1 kHz	<= 75 kHz
Min Offset	4.5 kHz	4.6 kHz	-1.0 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 / 50us	6.24 kHz	-6.30 kHz	-7.35 kHz	+/- 20 kHz
Max Drift	6 kHz	-11 kHz	9 kHz	DH1: +/- 25kHz
Average Drift	1 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 / 50us	-5.46 kHz	5.92 kHz	-6.81 kHz	+/- 20 kHz
Max Drift	12 kHz	11 kHz	8 kHz	DH1: +/- 25kHz
Average Drift	2 kHz	0 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 - High Channel	DH1	DH3	DH5	Limits
Drift Rate / 50us	6.30 kHz	-7.22 kHz	6.17 kHz	+/- 20 kHz
Max Drift	9 kHz	11 kHz	11 kHz	DH1: +/- 25kHz
Average Drift	3 kHz	0 kHz	5 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'	158.6 kHz	160.6 kHz	159.8 kHz	140kHz < F1 < 175kHz
'F1max'	167.0 kHz	167.8 kHz	167.4 kHz	
F1 Packets Failed	0	0	0	
'F2avg'	159.6 kHz	158.2 kHz	158.7 kHz	
'F2max'	143.1 kHz	143.4 kHz	142.8 kHz	>= 115 kHz
'F2max' Pass Rate	100.00%	100.00%	100.00%	
F1/F2 Ratio	1.00	0.98	0.99	>= 0.8
Total Packets Tested	20	20	20	
Result	Pass	Pass	Pass	

RCV/CA/01/C (Single Sensitivity)

Power Level: -87 dBm, Dirty Tx Status: ON

Hopping ON	Any	Limits
Overall BER	0.03%	<= 0.1%
Overall FER	2.19%	<= 100%
Packets Sent	7408	
Total Packets Tested	7383	
Bit Errors	441	
Total Packets Failed	162	
CRC Errors	136	
Length Errors	1	
Lost Packets	25	
Result	Pass	

Hopping OFF	Low	Med	High	Limits
Overall BER	0.00%	0.00%	0.00%	<= 0.1%
Overall FER	0.28%	0.62%	0.09%	<= 100%
Packets Sent	7408	7408	7408	
Total Packets Tested	7394	7377	7403	
Bit Errors	6	12	2	
Total Packets Failed	21	46	7	
CRC Errors	7	15	2	
Length Errors	0	0	0	
Lost Packets	14	31	5	
Result	Pass	Pass	Pass	

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

Power Level: -84 dBm, Dirty Tx Status: ON, Packet Length Tested: DH5

Hopping ON	Any	Limits
Overall BER	0.09%	<= 0.1%
Overall FER	6.78%	<= 100%
Packets Sent	590	
Total Packets Tested	586	
Bit Errors	1439	
Total Packets Failed	40	
CRC Errors	35	
Length Errors	1	
Lost Packets	4	
Result	Pass	

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

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

Power Level: -40dBm

Hopping OFF	Low	Med	High	Limits
Overall BER	0.00%	0.00%	0.00%	<= 0.1%
Overall FER	0.00%	0.00%	0.00%	<= 100%
Packets Sent	7408	7408	7408	
Total Packets Tested	7408	7408	7408	
Bit Errors	0	0	0	
Total Packets Failed	0	0	0	
CRC Errors	0	0	0	
Length Errors	0	0	0	
Lost Packets	0	0	0	
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	0.20 dB	0.19 dB	0.14 dB	Max: 1.00 dB
Min difference	0.18 dB	0.16 dB	0.12 dB	Min: -4.00 dB
Avg difference	0.19 dB	0.17 dB	0.13 dB	
GFSK Max	5.87 dBm	6.16 dBm	5.33 dBm	
GFSK Min	5.84 dBm	6.13 dBm	5.29 dBm	
GFSK Avg	5.86 dBm	6.15 dBm	5.31 dBm	
GFSK Pk	6.04 dBm	6.36 dBm	5.53 dBm	
DPSK Max	6.06 dBm	6.33 dBm	5.44 dBm	
DPSK Min	6.03 dBm	6.30 dBm	5.42 dBm	
DPSK Avg	6.04 dBm	6.32 dBm	5.43 dBm	
DPSK Pk	8.71 dBm	8.91 dBm	7.93 dBm	
Result	Pass	Pass	Pass	

2Mbits/sec EUT Min

Hopping OFF	Low	Med	High	Limits
Max difference	0.27 dB	0.30 dB	0.31 dB	Max: 1.00 dB
Min difference	0.25 dB	0.27 dB	0.28 dB	Min: -4.00 dB
Avg difference	0.26 dB	0.28 dB	0.30 dB	
GFSK Max	-25.98 dBm	-27.25 dBm	-29.40 dBm	
GFSK Min	-28.00 dBm	-27.28 dBm	-29.44 dBm	
GFSK Avg	-25.98 dBm	-27.26 dBm	-29.41 dBm	
GFSK Pk	-25.75 dBm	-26.98 dBm	-29.12 dBm	
DPSK Max	-25.72 dBm	-26.97 dBm	-29.11 dBm	
DPSK Min	-25.75 dBm	-27.00 dBm	-29.14 dBm	
DPSK Avg	-25.73 dBm	-26.98 dBm	-29.12 dBm	
DPSK Pk	-22.96 dBm	-24.20 dBm	-26.25 dBm	
Result	Pass	Pass	Pass	

3Mbits/sec EUT Max

Hopping OFF	Low	Med	High	Limits
Max difference	0.21 dB	0.19 dB	0.14 dB	Max: 1.00 dB
Min difference	0.18 dB	0.15 dB	0.11 dB	Min: -4.00 dB
Avg difference	0.20 dB	0.17 dB	0.13 dB	
GFSK Max	5.90 dBm	6.28 dBm	5.33 dBm	
GFSK Min	5.85 dBm	6.13 dBm	5.30 dBm	
GFSK Avg	5.88 dBm	6.18 dBm	5.32 dBm	
GFSK Pk	6.07 dBm	6.48 dBm	5.54 dBm	
DPSK Max	6.09 dBm	6.44 dBm	5.46 dBm	
DPSK Min	6.04 dBm	6.30 dBm	5.42 dBm	
DPSK Avg	6.07 dBm	6.35 dBm	5.44 dBm	
DPSK Pk	8.78 dBm	9.06 dBm	7.98 dBm	
Result	Pass	Pass	Pass	

3Mbits/sec		EUT Min		
Hopping OFF	Low	Med	High	Limits
Max difference	0.27 dB	0.29 dB	0.31 dB	Max: 1.00 dB
Min difference	0.24 dB	0.28 dB	0.29 dB	Min: -4.00 dB
Avg difference	0.26 dB	0.28 dB	0.30 dB	
GFSK Max	-25.96 dBm	-27.24 dBm	-29.39 dBm	
GFSK Min	-25.99 dBm	-27.27 dBm	-29.42 dBm	
GFSK Avg	-25.97 dBm	-27.25 dBm	-29.41 dBm	
GFSK Pk	-25.75 dBm	-26.98 dBm	-29.10 dBm	
DPSK Max	-25.70 dBm	-26.96 dBm	-29.10 dBm	
DPSK Min	-25.75 dBm	-26.99 dBm	-29.13 dBm	
DPSK Avg	-25.71 dBm	-26.97 dBm	-29.11 dBm	
DPSK Pk	-22.85 dBm	-24.02 dBm	-26.14 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	11.1 kHz	9.1 kHz	7.2 kHz	-75 kHz < ωi < 75 kHz
Frequency Error	-2 kHz	1.2 kHz	-1.2 kHz	-10 kHz < ωo < 10 kHz
Block Frequency Error	11 kHz	9.2 kHz	7.9 kHz	-75 kHz < ωi + ωo < 75 kHz
RMS DEVM	0.054	0.055	0.059	<= 0.2 (2Mbps)
Peak DEVM	0.148	0.138	0.157	<= 0.35 (2Mbps)
99% DEVM	100.00%	100.00%	100.00%	% Symbols <= 0.3 (2Mbps)
Average RMS DEVM	0.043	0.043	0.044	
Result	Pass	Pass	Pass	

	3Mbits/sec			
Hopping OFF	Low	Med	High	Limits
Initial Frequency Error	11 kHz	8.9 kHz	7.1 kHz	-75 kHz < ωi < 75 kHz
Frequency Error	-1.6 kHz	-1 kHz	1.4 kHz	-10 kHz < ωo < 10 kHz
Block Frequency Error	11.1 kHz	9.3 kHz	8 kHz	-75 kHz < ωi + ωo < 75 kHz
RMS DEVM	0.051	0.052	0.053	<= 0.13 (3Mbps)
Peak DEVM	0.142	0.124	0.151	<= 0.25 (3Mbps)
99% DEVM	100.00%	100.00%	100.00%	% Symbols <= 0.2 (3Mbps)
Average RMS DEVM	0.040	0.040	0.040	
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 %
CRC 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 %
CRC 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: -84 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	0	0	1	
CRC FERs	0	0	0	
Length FERs	0	0	0	
Lost Pkt FERs	0	0	1	
Packets received	300	300	299	
Result	Pass	Pass	Pass	

		3Mbits/sec		
Hopping OFF	**Low**	**Med**	**High**	**Limits**
Overall BER	1.75E-006	2.91E-006	5.83E-007	7.0E-005
Bits in error	3	5	1	1.0E-004
Packets sent	210	210	210	
Packets in error	3	4	2	
CRC FERs	3	4	2	
Length FERs	0	0	0	
Lost Pkt FERs	0	0	0	
Packets received	210	210	210	
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	0	0	0	
CRC FERs	0	0	0	
Length FERs	0	0	0	
Lost Pkt FERs	0	0	0	
Packets received	295	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	
CRC FERs	0	0	0	
Length FERs	0	0	0	
Lost Pkt FERs	0	0	0	
Packets received	196	196	196	
Result	Pass	Pass	Pass	

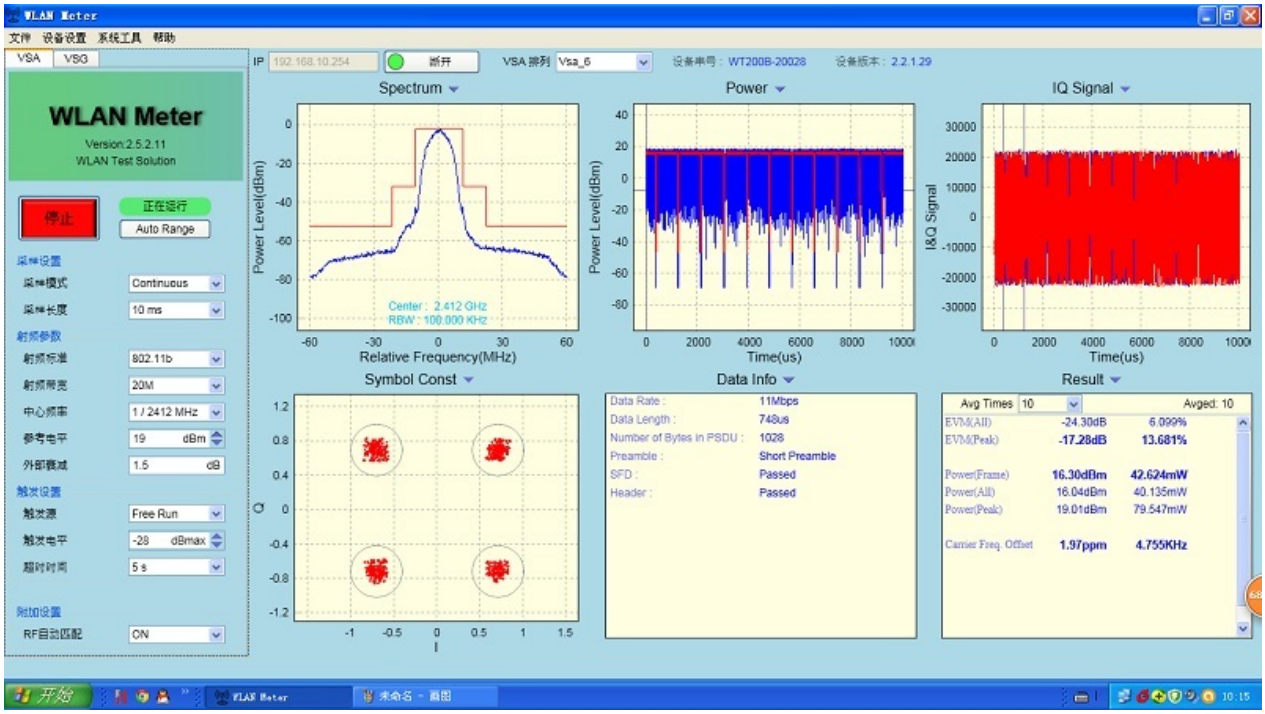
---- Report End ----

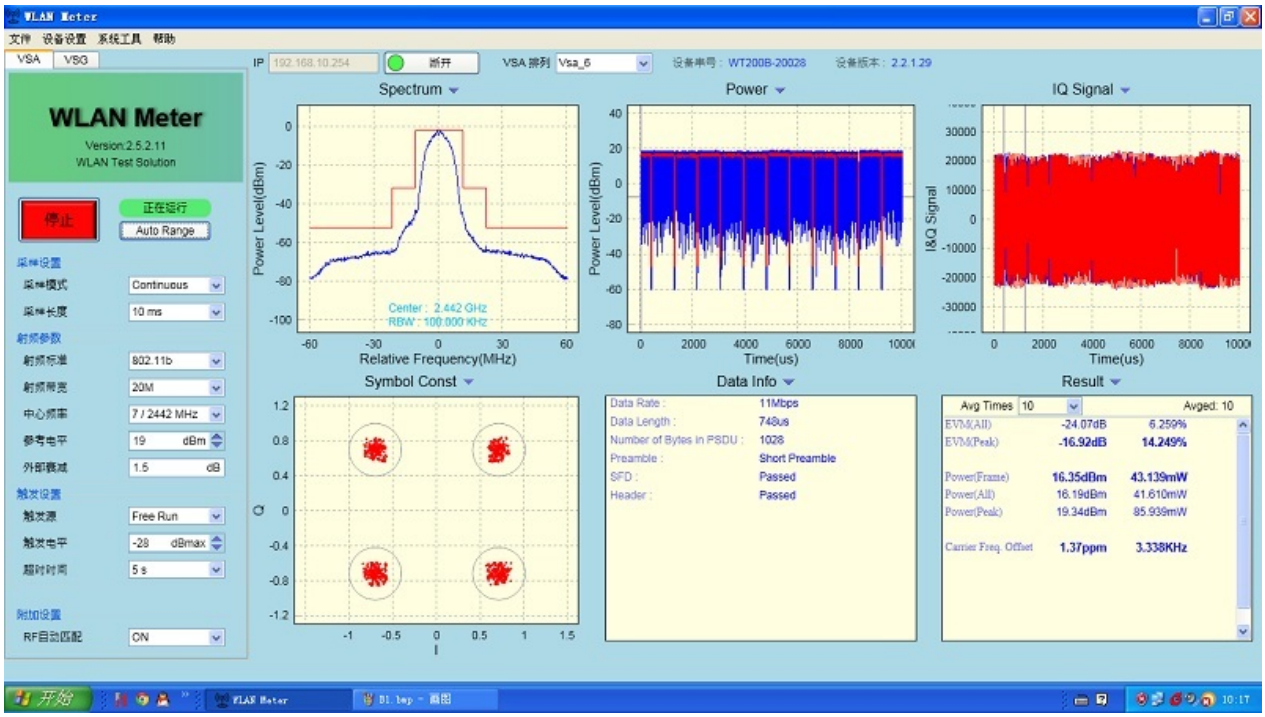
BPI-M64 WIFI Lab test

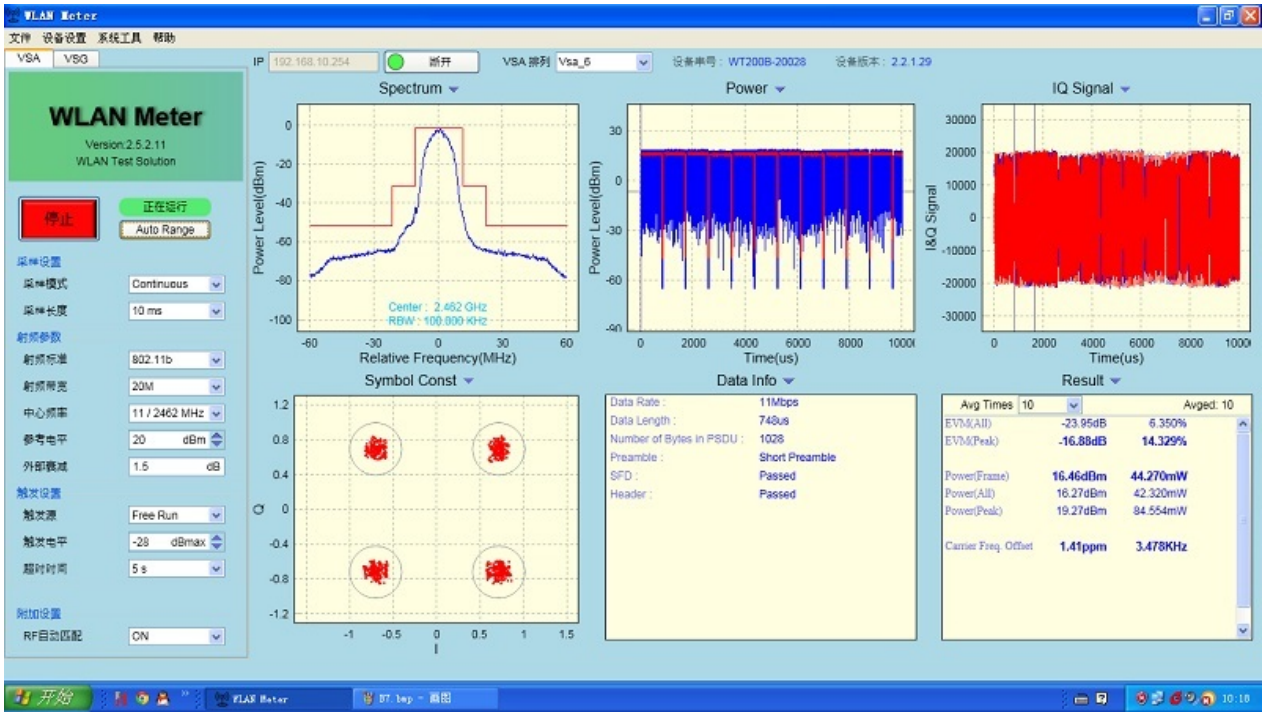
Date: 2016/8/22

Overall Result: **PASS**

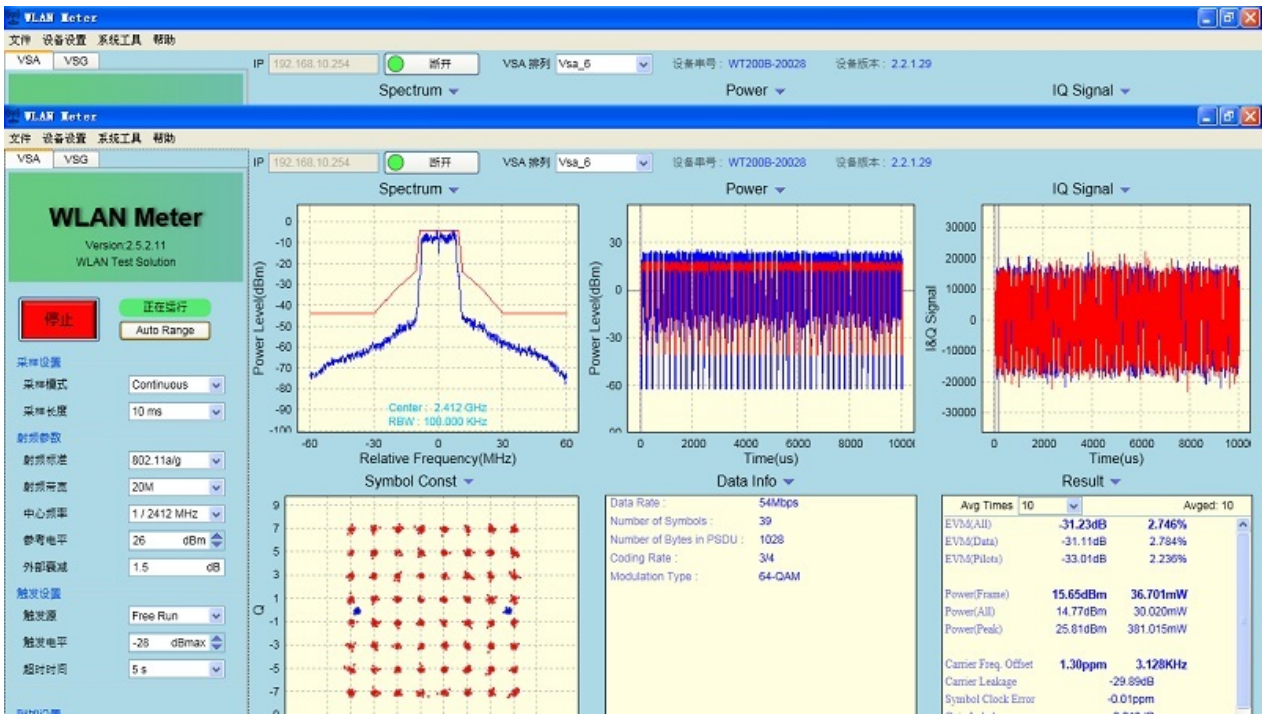
AP 6212 wifi 802.11 B test report

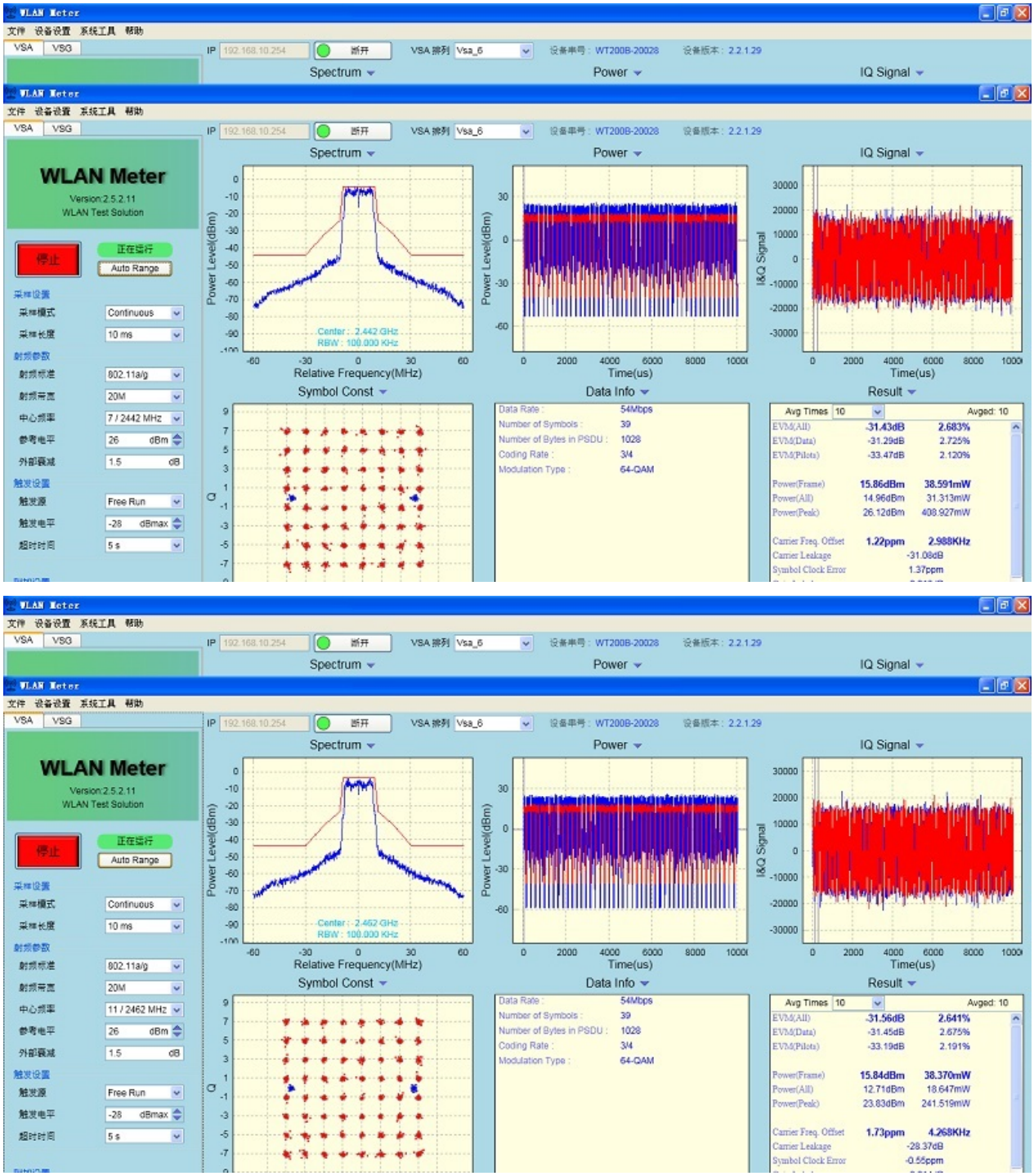




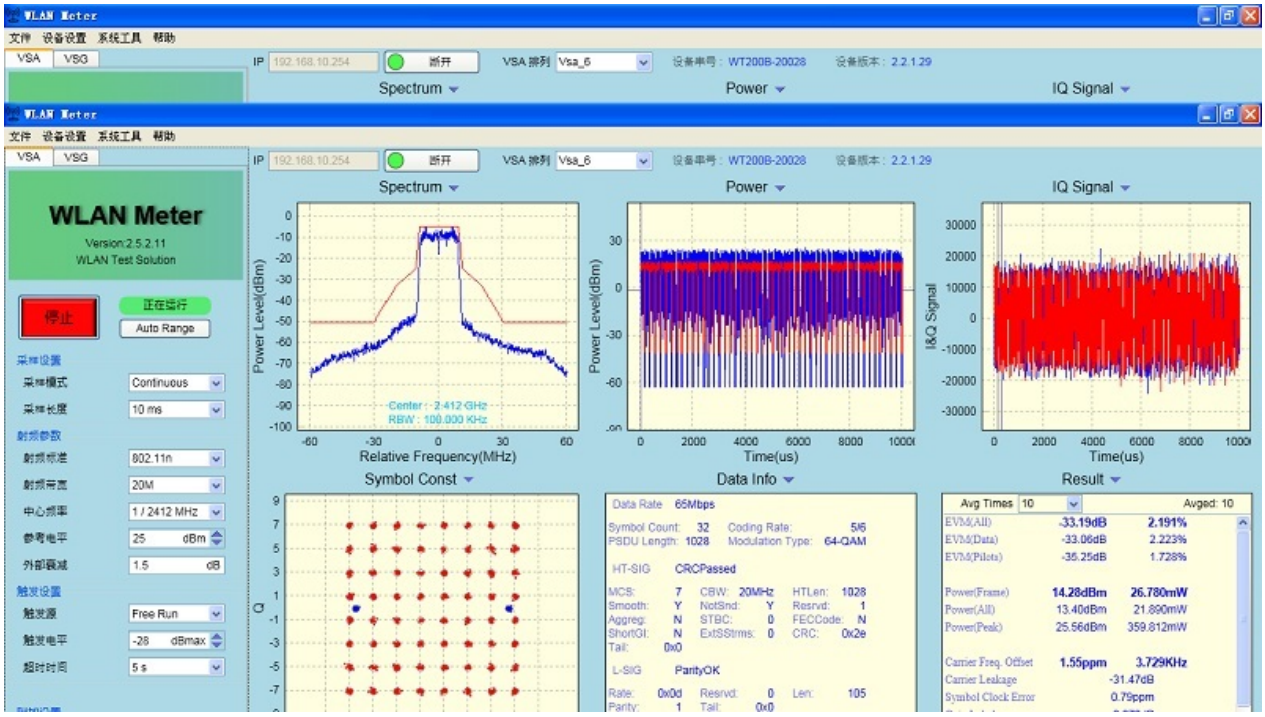


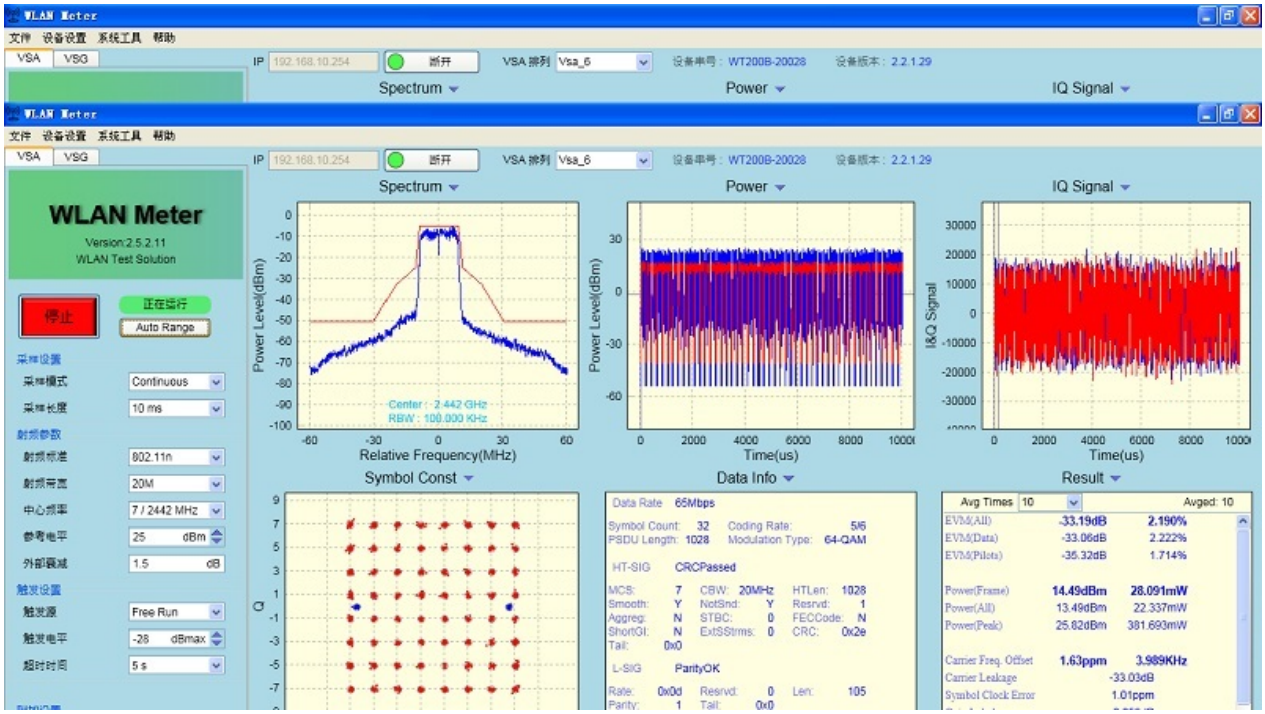
AP 6212 wifi 802.11 G test report

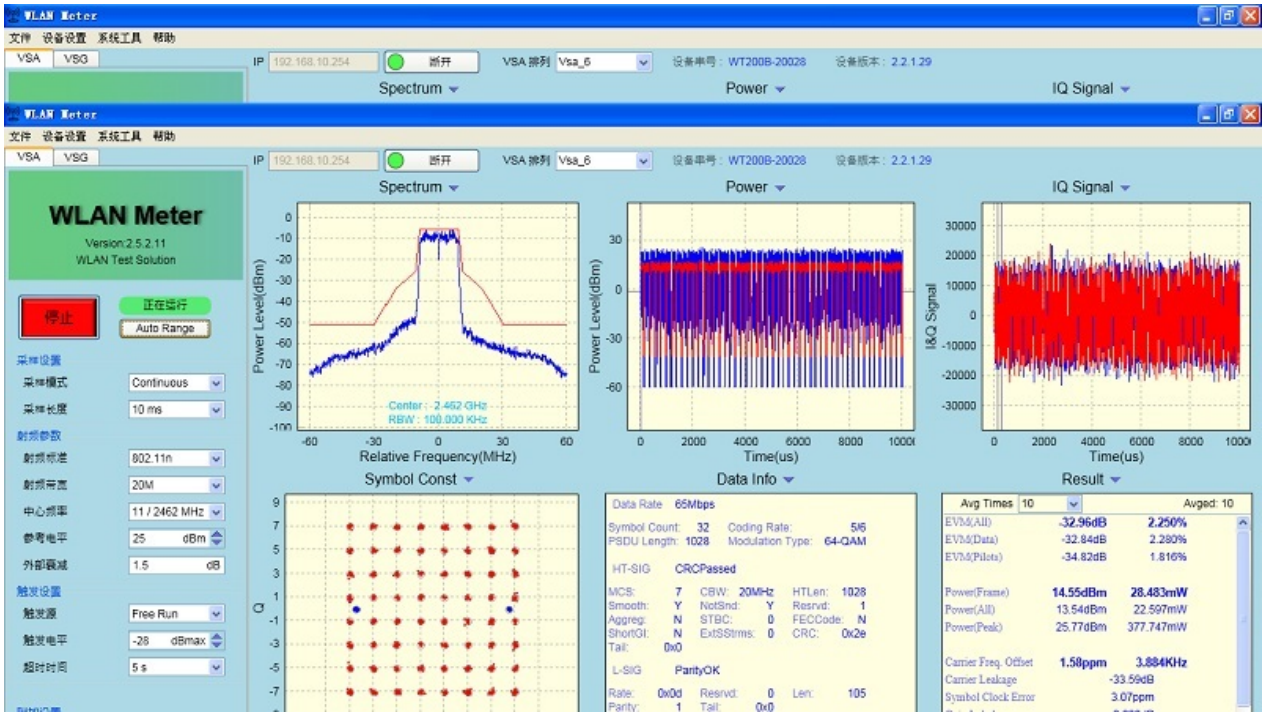


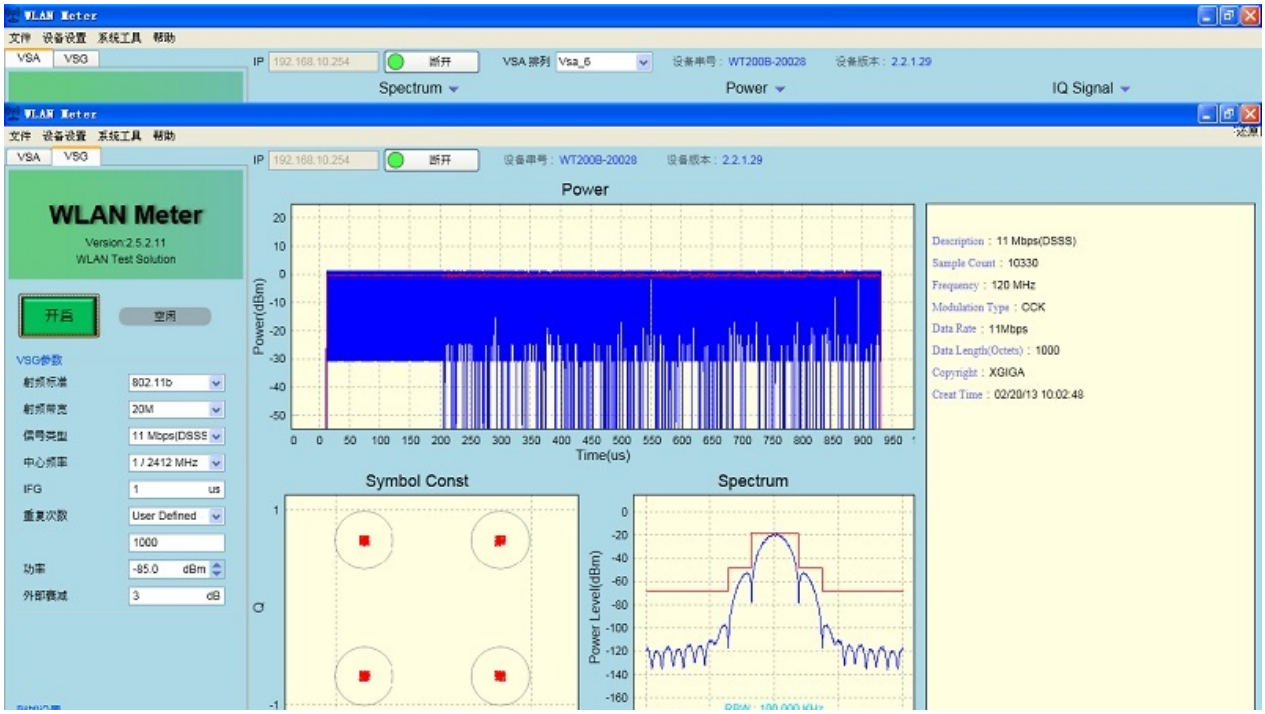


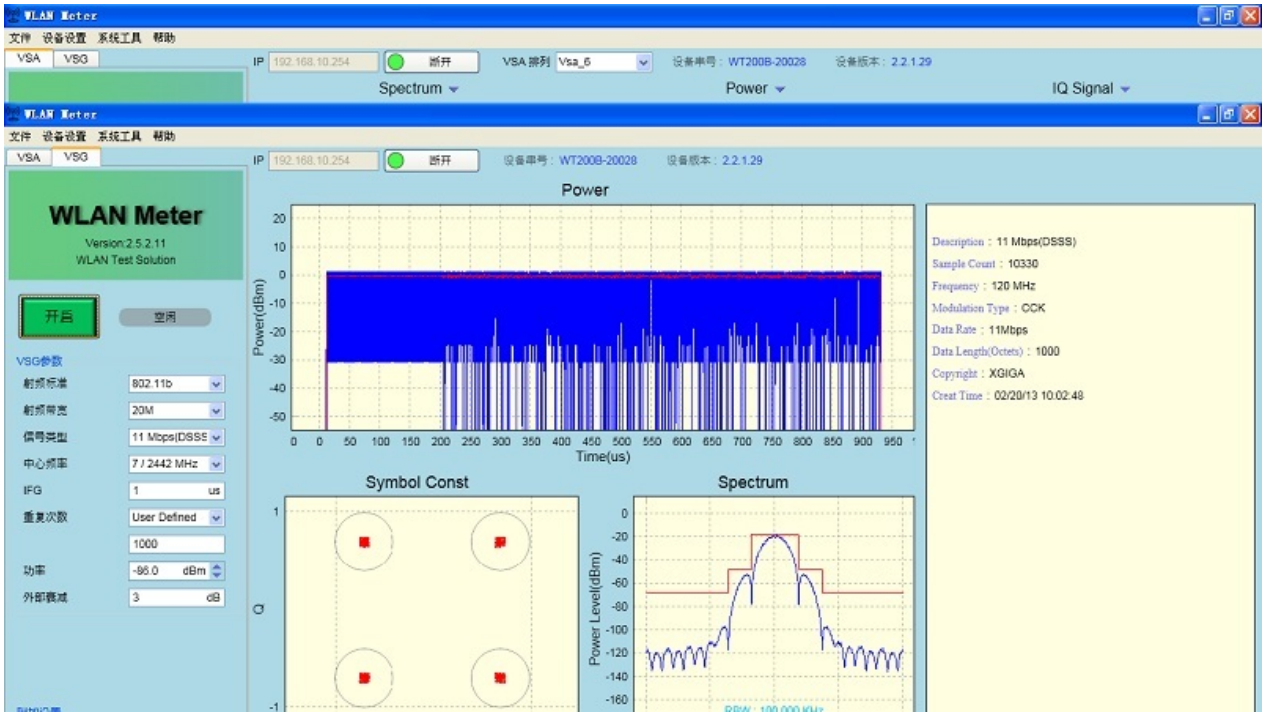
AP 6212 wifi 802.11 N test report

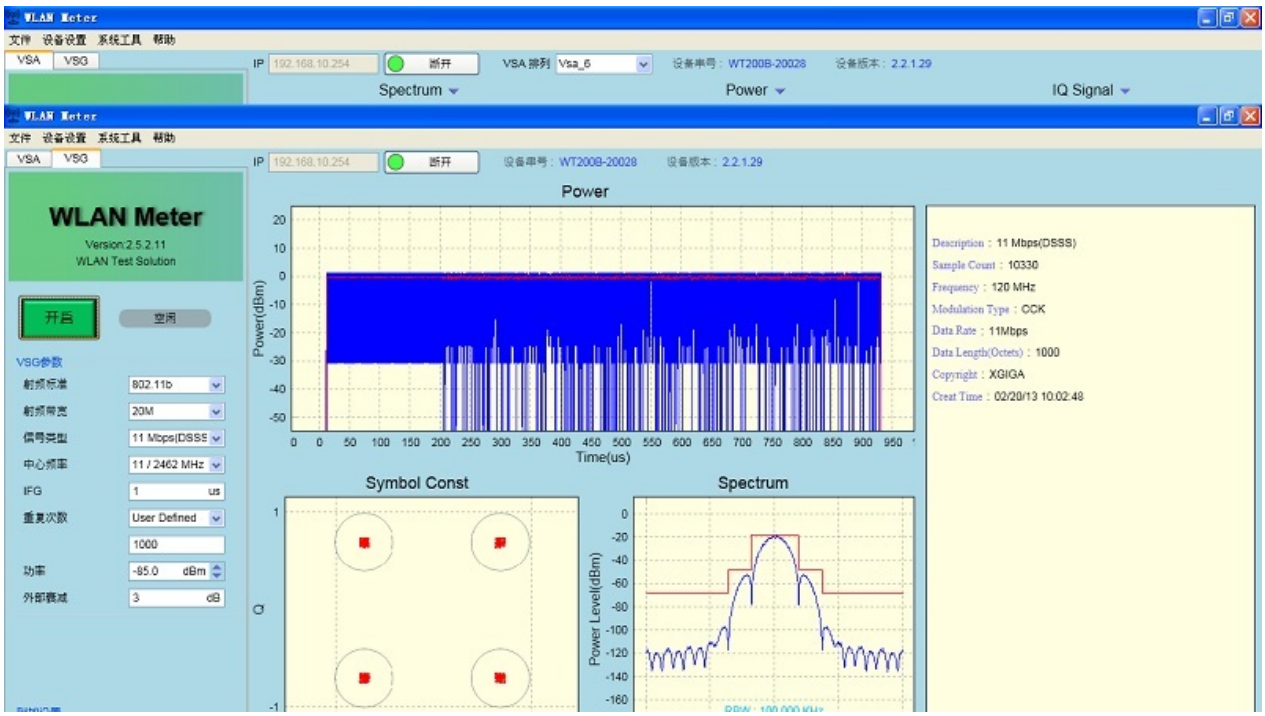

WLAN Meter
Version:2.5.2.11
WLAN Test Solution
Spectrum
Power
IQ Signal
Symbol Const
Data Info
Result
Center : 2.412 GHz
RBW : 100.000 KHz
Relative Frequency(MHz)
Time(us)
Data Rate 65Mbps
Symbol Count: 32
Coding Rate: 5/6
PSDU Length: 1028
Modulation Type: 64-QAM
HT-SIG CRCPassed
L-SIG ParityOK
EVM(All) -33.19dB 2.191%
EVM(Data) -33.06dB 2.223%
EVM(Pilots) -35.25dB 1.728%
Power(Frame) 14.28dBm 26.780mW
Power(All) 13.40dBm 21.890mW
Power(Peak) 25.56dBm 359.812mW
Carrier Freq. Offset 1.55ppm 3.729KHz
Carrier Leakage -31.47dB
Symbol Clock Error 0.79ppm

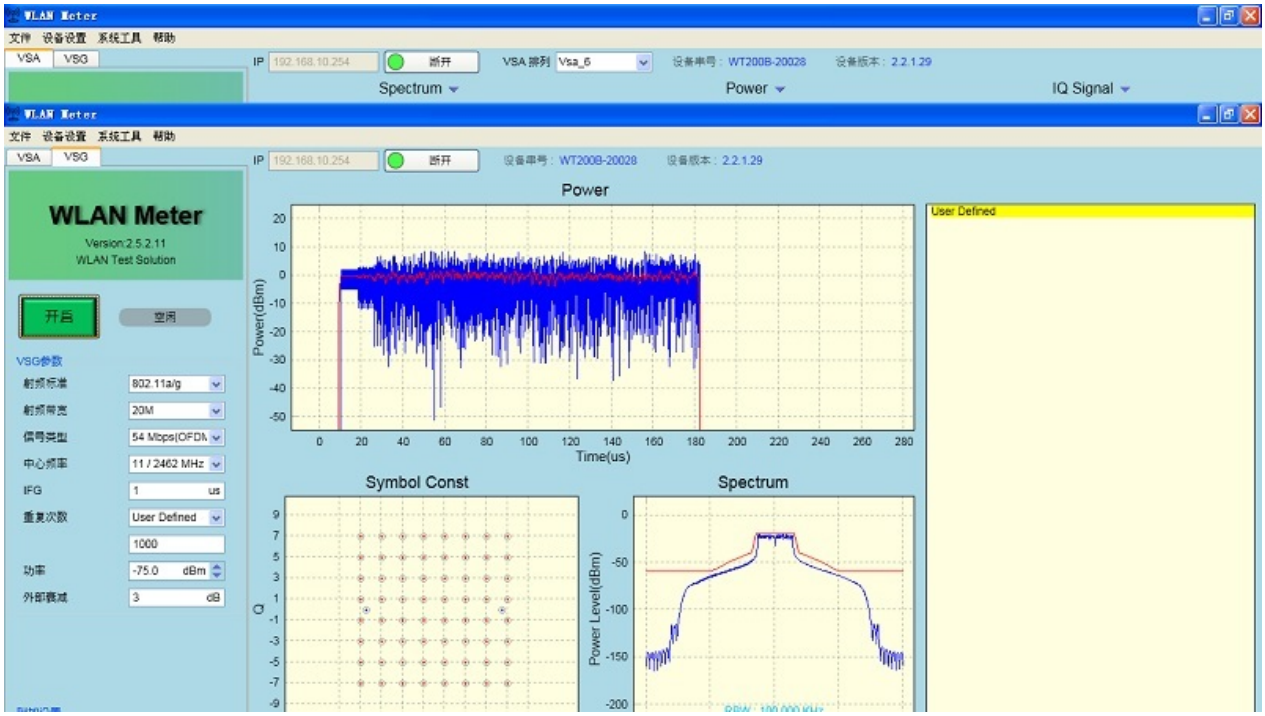

WLAN Meter
Version:2.5.2.11
WLAN Test Solution
Spectrum
Power
IQ Signal
Symbol Const
Data Info
Result
Center : 2.442 GHz
RBW : 100.000 KHz
Relative Frequency(MHz)
Time(us)
Data Rate 65Mbps
Symbol Count: 32
Coding Rate: 5/6
PSDU Length: 1028
Modulation Type: 64-QAM
HT-SIG CRCPassed
L-SIG ParityOK
EVM(All) -33.19dB 2.190%
EVM(Data) -33.06dB 2.222%
EVM(Pilots) -35.32dB 1.714%
Power(Frame) 14.49dBm 28.091mW
Power(All) 13.49dBm 22.337mW
Power(Peak) 25.82dBm 381.693mW
Carrier Freq. Offset 1.63ppm 3.989KHz
Carrier Leakage -33.03dB
Symbol Clock Error 1.01ppm

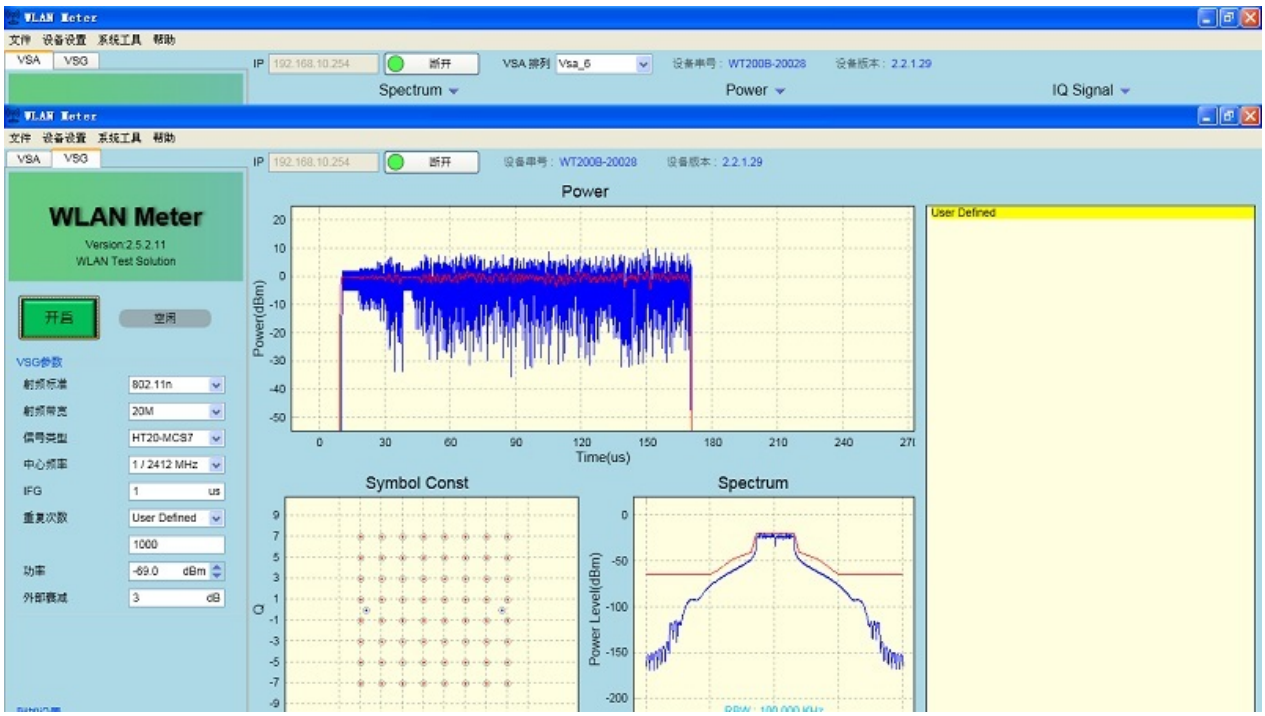

WLAN Meter
Version:2.5.2.11
WLAN Test Solution
Spectrum
Power
IQ Signal
Symbol Const
Data Info
Result
Data Rate 65Mbps
Symbol Count: 32
PSDU Length: 1028
Coding Rate: 5/6
Modulation Type: 64-QAM
HT-SIG CRCPassed
L-SIG ParityOK
Relative Frequency(MHz)
Time(us)
Power Level(dBm)
I&Q Signal


WLAN Meter
Version:2.5.2.11
WLAN Test Solution
Power
Symbol Const
Spectrum
Description : 11 Mbps(DSSS)
Sample Count : 10330
Frequency : 120 MHz
Modulation Type : CCK
Data Rate : 11Mbps
Data Length(Octets) : 1000
Copyright : XGIGA
Creat Time : 02/20/13 10:02:48
Time(us)
Power(dBm)
Power Level(dBm)


WLAN Meter
文件 设备设置 系统工具 帮助
VSA VSG
IP 192.168.10.254
断开
VSA 排列 Vsa_6
设备串号：WT200B-20028
设备版本：2.2.1.29
Spectrum
Power
IQ Signal
WLAN Meter
Version:2.5.2.11
WLAN Test Solution
开启
空闲
VSG参数
射频标准 802.11b
射频带宽 20M
信号类型 11 Mbps(DSSS
中心频率 7 / 2442 MHz
IFG 1 us
重复次数 User Defined
1000
功率 -95.0 dBm
外部衰减 3 dB
Power
Power(dBm)
Time(us)
Description：11 Mbps(DSSS)
Sample Count：10330
Frequency：120 MHz
Modulation Type：CCK
Data Rate：11Mbps
Data Length(Octets)：1000
Copyright：XGIGA
Creat Time：02/20/13 10:02:48
Symbol Const
Q
Spectrum
Power Level(dBm)

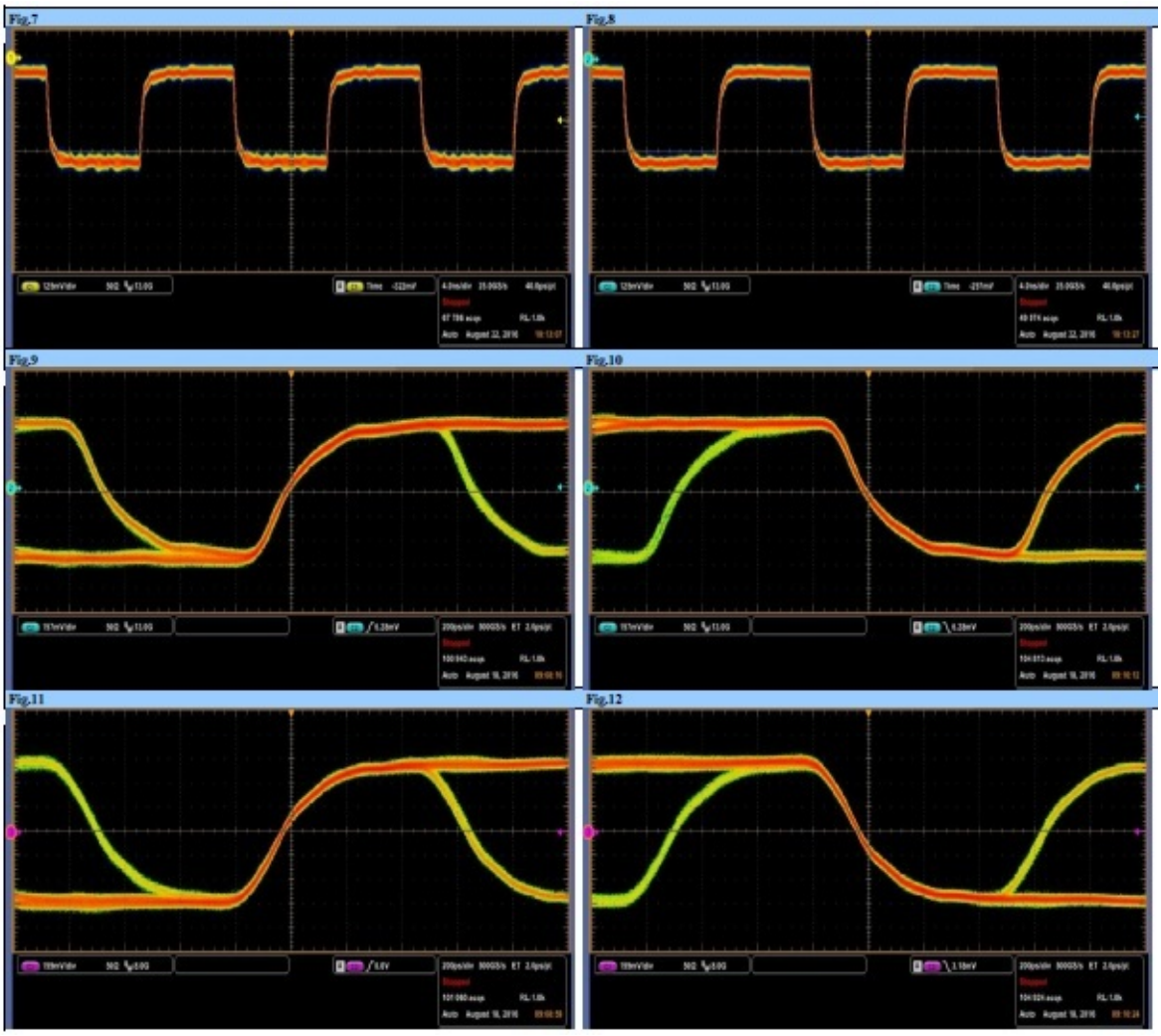

WLAN Meter
文件 设备设置 系统工具 帮助
VSA VSG
IP 192.168.10.254
断开
VSA 排列 Vsa_6
设备串号：WT200B-20028
设备版本：2.2.1.29
Spectrum
Power
IQ Signal
WLAN Meter
Version:2.5.2.11
WLAN Test Solution
开启
空闲
VSG参数
射频标准 802.11b
射频带宽 20M
信号类型 11 Mbps(DSSS
中心频率 11 / 2462 MHz
IFG 1 us
重复次数 User Defined
1000
功率 -95.0 dBm
外部衰减 3 dB
Power
Power(dBm)
Time(us)
Description：11 Mbps(DSSS)
Sample Count：10330
Frequency：120 MHz
Modulation Type：CCK
Data Rate：11Mbps
Data Length(Octets)：1000
Copyright：XGIGA
Creat Time：02/20/13 10:02:48
Symbol Const
Q
Spectrum
Power Level(dBm)


WLAN Meter
文件 设备设置 系统工具 帮助
VSA VSG
IP 192.168.10.254
断开
VSA 排列 Vsa_6
设备串号：WT200B-20028
设备版本：2.2.1.29
Spectrum
Power
IQ Signal
WLAN Meter
Version:2.5.2.11
WLAN Test Solution
开启
空闲
VSG参数
射频标准 802.11a/g
射频带宽 20M
信号类型 54 Mbps(OFDM
中心频率 11 / 2462 MHz
IFG 1 us
重复次数 User Defined
1000
功率 -75.0 dBm
外部衰减 3 dB
Power
Power(dBm)
Time(us)
User Defined
Symbol Const
Q
Spectrum
Power Level(dBm)


WLAN Meter
文件 设备设置 系统工具 帮助
VSA VSG
IP 192.168.10.254
断开
VSA 排列 Vsa_6
设备串号：WT200B-20028
设备版本：2.2.1.29
Spectrum
Power
IQ Signal
WLAN Meter
Version:2.5.2.11
WLAN Test Solution
开启
空闲
VSG参数
射频标准 802.11n
射频带宽 20M
信号类型 HT20-MCS7
中心频率 1 / 2412 MHz
IFG 1 us
重复次数 User Defined
1000
功率 -69.0 dBm
外部衰减 3 dB
Power
Power(dBm)
Time(us)
User Defined
Symbol Const
Q
Spectrum
Power Level(dBm)

BPI-M64 validation test report

Banana Pi BPI-M64 have finished all validation test, all test pass,test report please download from below link:



- WIFI&BT validation test

  https://drive.google.com/file/d/0B4PAo2nW2KfnRFJaT1RIbURVNW8/view?usp=sharing

- BPI-M64_EVT-USB2.0-SI_TR_Ver.A_20160818 validation test

  https://drive.google.com/file/d/0B4PAo2nW2Kfnb3RHTDNaeVoyZFE/view?usp=sharing

- BPI-M64_EVT-HDMI(720p)_SI_TR_20160822 validation test

  https://drive.google.com/file/d/0B4PAo2nW2KfnOEZJZ1pvdEo3ZVk/view?usp=sharing

- BPI-M64_EVT-HDMI(1080p)_SI_TR_20160822 validation test

  https://drive.google.com/file/d/0B4PAo2nW2KfnQ0xoUnRZRzdGeTg/view?usp=sharing

- BPI-M64_DVT-DDR3(SKhynix)-SI_TR_Ver.A_20160905 validation test

https://drive.google.com/file/d/0B4PAo2nW2KfnR2FsREF0V1NJQXM/view?usp=sharing

- BPI-M64_DVT-DDR3(NANYA)-SI_TR_Ver.A_20160901validation test

  https://drive.google.com/file/d/0B4PAo2nW2KfnYUpIT0RDRTlVTzQ/view?usp=sharing

all test report download link on google driver:

https://drive.google.com/folderview?id=0B4PAo2nW2KfnV2RZdDVOcTVkOW8&usp=sharing

BPI-M64 CE FCC RoHS Certification

BPI-M64 CE Certification

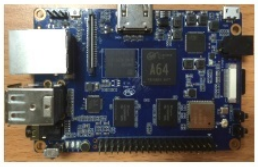
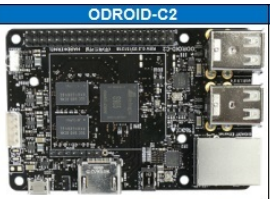
BPI-M64 FCC Certification

BPI-M64 RoHS Certification

All Banana Pi SBC Comparison

Banana Pi BPI-M1	Banana Pi BPI-M1+	Banana Pi BPI-M2+	Banana Pi BPI-M2	Banana Pi BPI-M3	Banana Pi BPI-M64
					
A20 32 Bit Cortex™-A7 Dual-Core		H3 32 Bit Cortex™-A7 Quad-Core	A31S 32 Bit Cortex™-A7 Quad-Core	A83T 32 Bit Cortex™-A7 Octa-Core	A64 64 Bit Cortex A53 Quad Core
ARM® Mali400MP2 Complies with OpenGL ES 2.0/1.1			PowerVR SGX544MP2 GPU Support OpenGL ES 2.0, OpenVG 1.1, OpenCL 1.1, and DX 9.3 standards		ARM® Mali400MP2 Complies with OpenGL ES 2.0/1.1
1GB DDR3 (shared with GPU)				2GB LPDDR3 (shared with GPU)	
SD (Max. 32GB)/MMC card slot SATA 2.0 port via SOC	MicroSD (TF) card / MMC card slot SATA 2.0 port via SOC	MicroSD (TF) card, eMMC 8GB	MicroSD (TF) card / MMC card slot	MicroSD (TF) card, eMMC 8GB SATA 2.0 port via USB	MicroSD (TF) card, eMMC 8GB
10/100/1000 Ethernet					
N/A	802.11b/g/n	802.11b/g/n & BT4.0	802.11b/g/n	802.11b/g/n & BT4.0	
HDMI, CVBS , LVDS/RGB		HDMI	HDMI, LVDS/RGB	HDMI, MIPI Display Serial Interface (DSI)	
Parallel 8-bit camera interface				Parallel 8-bit camera interface MIPI Camera serial Interface(CSI)	
HDMI 1.4 transmitter with HDCP LVDS/Sync RGB/CPU LCD interface up to 1920x1200 Video decoding speed up to 1080p@60fps Video encoding H.264 HP up to 1080p@30fps		Support H.265 decode by 4K@30fps, HDMI 1.4 1080p@60fps Support H.264 video encoding up to 1080p@30fps	HDMI 1.4 1080p@60fps LVDS/RGB/CUP LCD interface 1280x800 Decoding up to 1920x1080@60fps Video encoding H.264 HP: speed up 1920x1080@30fps	Support 4-lane MIPI DSI up to 1920x1200@60Hz HDMI 1.4 output with HDCP 1.2 Support LVDS up to 1366x768@60Hz HEVC/H.265 decoder(SW), Main profile, 1080p@30fps H.264 video encoding up to 1080p@60fps, 720p@120fps	Multi-format FHD video decoding, including Mpeg1/2, Mpeg4, H.263, H.264, etc H.264 decode up to 1080P60,H.265 decode up to 4KP30
3.5 mm Jack and HDMI		HDMI	3.5 mm Jack and HDMI		
26-PIN: GPIO, UART, I²C bus, SPI bus with two chip selects, CAN bus,PWM,+3.3 V, +5 V, ground	40-PIN: GPIO, UART, I²C bus,I²S bus,SPI bus with two chip selects, CAN bus, PWM,+3.3 V, +5 V, ground	40-PIN: PWM,GPIO,UART,I²C bus,I²S bus,SPI bus,+3.3v,+5v,ground.			
5 volt via MicroUSB and/or MicroUSB (OTG)		5 volt via DC In and/or MicroUSB (OTG)			
2 USB ports, 1 OTG microUSB port			4 USB 2.0 ports, 1 OTG microUSB port	2 USB 2.0 ports, 1 OTG microUSB port	
Reset button, Power button, Uboot button			Power button, Uboot button	Reset button, Power button, Uboot button	Reset button, Power button
Power LED (red), RJ45 LED (blue), user define LED (green)		Power LED (red,Can be defined by user)	User define LED (red/power, blue, green)		
IR reciever					
92 mm × 60mm		65 x 65mm	92 mm × 60mm		
20 mm x 80mm x 105mm					
60g		48g	60g		
Android 4.4 and Linux etc. OS				Android 6.0 & Linux OS	

BPI-M64 vs RPI 3 vs Odroid vs Pine64

	Banana pi BPI-M64	Raspberry Pi 3	ODROID-C2	Pine A64 Plus
Photo				
Processor	Allw inner A64 64bit quad core Cortex A53 processor @ 1.2 GHz	Broadcom BCM2837 quad core Cortex A53 processor @ 1.2 GHz(4x ~2760 DMIPS)	Amlogic S905 quad core Cortex A53 processor @ 2.0 GHz(4x ~4600 DMIPS)	Allw inner A64 quad core Cortex A53 processor @ 1.2 GHz
GPU	ARM Mali-400MP2	VideoCore IV @ 300/400 MHz	Penta core (3+2) ARM Mali-450	ARM Mali-400MP2
Video Decoding	H.265/HEVC @ up to 4K @ 30 fps, H.264, VP8, AVS/AVS+ & MPEG1/2/2 @ 1080p60 , VC1 and MJPEG up to 1080p @ 30 fps	1080p30 for H.264, MPEG2* and VC1* 1080p video encoding (H.264) * Extra licenses required	8-/10-bit H.265 up to 4K @ 60fps, H.264 up to 4K @ 30 fps, H.263, VC1, Mpeg1/2, AVS, Realvideo up to 1080p60	H.265/HEVC @ up to 4K @ 30 fps, H.264, VP8, AVS/AVS+ & MPEG1/2/2 @ 1080p60 , VC1 and MJPEG up to 1080p @ 30 fps
Video Encoding	H.264 up to 1080p@60fps	Full HD H.264 video encoding	H.264 up to 1080p@60fps	H.264 up to 1080p@60fps
RAM	2GB DDR3	1GB LPDDR2	2GB DDR3	1 or 2GB DDR3
Storage	micro SD card slot & eMMC 8GB	micro SD card slot, non EMMC 8GB	micro SD card slot, non EMMC 8GB	micro SD card slot, non EMMC 8GB
Ethernet	Gigabit Ethernet	10/100M Ethernet via USB bridge	Gigabit Ethernet	Gigabit Ethernet
Wireless Connectivity	WiFi 802.11 b/g/n (2.4GHz) and BT 4.0 LE	WiFi 802.11 b/g/n (2.4GHz) and BT 4.1 LE	Non WIFI_BT	optional WiFi 802.11 b/g/n & BT
USB	2x USB 2.0 host ports 1x micro USB OTG port	4x USB 2.0 host ports 1x micro USB port	4x USB 2.0 host ports 1 x micro USB OTG port	2x USB 2.0 host ports 1x micro USB port
Disply	MIPI DSI	MIPI DSI	Non DSI	MIPI DSI
Camera	MIPI CSI	MIPI CSI	Non CSI	MIPI CSI
Video	HDMI 1.4 w ith CEC and 3.5mm composite	HDMI 1.4 w ith CEC and 3.5mm composite	HDMI 2.0 w ith CEC	HDMI 1.4
Audio	HDMI and 3.5mm audio jack	HDMI and 3.5 mm audio jack (Shared w ith composite video)	HDMI, non 3.5mm audio jack	HDMI and 3.5mm audio jack
GPIO	40-PIN: PWM,GPIO,UART,I²C bus,I²S bus,SPI bus,+3.3v,+5v,ground.	40-pin header w ith 26 –GPIOs, 1x UART (debugging), 1x SPI, 2x I2C, PCM/I2S, 2x PWM	40-pin header w ith GPIO, I2C, UART, PWM, 1-w ire, and ADC	40-pin Raspberry Pi 2 compatible header w ith up to 27x GPIOs, 1x I2C, 1x SPI, 1x UART.
Button	Reset button, Power button, Uboot button	Non Reset, Pow er and Uboot button	Non Reset, Pow er and Uboot button	Non Reset, Pow er and Uboot button
LED	User define LED (red/power, blue, green)	LED (red/power & green)	LED (pow er & status)	
Dimensions	90 x 62 mm	85 x 56 mm	85 x 56mm	127mm x 79mm
Linux Support	Official: Ubuntu 16.04 64-bit w ith Kernel 3.10 (No sure about GPU and VPU support)	Official: Raspbian w ith recent Linux 4.x kernel. 32-bit user space only (currently)	Official: Ubuntu 16.04 32-bit and 64-bit images w ith Linux 3.14 kernel Amlogic S905 Mainline Linux support in progress(but likely preliminary)	Official: Ubuntu 16.04 64-bit w ith Kernel 3.10 (No sure about GPU and VPU support) Mainline support in progress.
Android Support	Android 5.1	No	Android 5.1	Android 5.1
Windows 10 IoT	No	Yes	No	No

Reference documents

A64 Linux-sunxi wiki

about allwinner A83T chip,please reference this link:

http://linux-sunxi.org/A83T

all about allwinner chip：

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

allwinner A64 chip documents

Allwinner A64 Datasheet V1.1

https://drive.google.com/file/d/0B4PAo2nW2KfnSW9lQnZ0d1RoVW8/view?usp=sharing

Allwinner A64 user Manual V1.1

https://drive.google.com/file/d/0B4PAo2nW2KfnNHk4dkFJZEdqYXc/view?usp=sharing

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

Some document about allwinner A64 chip

Some document about allwinner A64 chip . BPI-M64 use allwinner A64 chip design

AW 1689 DEVICE TREE&SYS CONFIG配置规范.pdf	2015-08-10 12:49	117K
AXP803 Datasheet V1.0.pdf	2015-08-10 12:49	1.7M
Allwinner Axx SDRAM Support List-V1.08 20150611.pdf	2015-08-10 12:49	176K
Allwinner NAND flash support list v1.71 20150615(1).pdf	2015-08-10 12:49	269K
Allwinner NAND flash support list v1.71 20150615.pdf	2015-08-10 12:49	216K
Allwinner A64 User Manual V1.1.pdf	2015-08-10 12:49	7.4M
Allwinner eMMC-tSD-fSD support list 20150612.pdf	2015-08-10 12:49	169K
AndroidModify V104 20120228.rar	2015-12-01 04:34	12M
Animation 00158.png	2015-07-28 12:53	27K
Image	2016-05-11 16:27	9.9M
a64-olinuxino.dtb	2016-10-13 16:00	67K
a64-olinuxino.dts	2016-11-01 08:51	123K
a64-olinuxino lcd.dtb	2016-09-16 11:38	67K
a64-olinuxino lcd.dts	2016-09-16 11:38	124K
a64.dts	2016-04-08 11:34	83K
a64 3G Dongle Support List.pdf	2015-08-10 12:49	246K
a64 defconfig	2016-11-01 08:53	85K
a64 new dts	2016-10-11 09:42	83K

more please see below link:

http://bundie.neterra.net:8080/a64/

All banana pi product

- **banana pi BPI-M1 allwinner A20 dual core single board computer**

  gitbook online datasheet:https://bananapi.gitbooks.io/bpi-m1/content/en/

- **banana pi BPI-M1+(BPI-M1+ plus) allwinner A20 dual core single board computer**

  gitbook online datasheet:https://bananapi.gitbooks.io/bpi-m1-bpi-m1-plus-/content/en/

- **banana pi BPI-M2 allwinner A31s quad core single board computer**

  gitbook online datasheet:https://bananapi.gitbooks.io/bpi-m2/content/en/

- **banana pi BPI-M2+（BPI-M2 Plus）allwinner H3 quad cord single board computer**

  gitbook online datasheet:https://bananapi.gitbooks.io/bpi-m2-/content/en/

- **banana pi BPI-M2 Ultra allwinner R40 quad core single board computer**

  gitbook online datasheet:https://bananapi.gitbooks.io/bpi-m2-ultra/content/

- **Banana pi BPI-M3 allwinner A83T (R58 H8) octa-core single board computer**

  gitbook online datasheet:https://bananapi.gitbooks.io/bpi-m3/content/en/

- **banana pi BPI-M64 allwinner A64 64 bit single board computer**

  gitbook online datasheet:https://bananapi.gitbooks.io/bpi-m64/content/en/

- **banana pi BPI-R1 allwinner A20 dual core smart router board**

  gitbook online datasheet:https://bananapi.gitbooks.io/bpi-r1/content/en/

- **banana pi BPI-D1 open source IP camera board**

  gitbook online datasheet:https://bananapi.gitbooks.io/bpi-d1/content/en/

- **banana pi BPI-G1 open source IoT development board**

  gitbook online datasheet:https://bananapi.gitbooks.io/bpi-g1/content/en/

- **banana pi BPI Accessories**

  gitbook online datasheet:https://bananapi.gitbooks.io/bpi-accessories/content/en/

- **BPI Open debugger burn development tool board**

  gitbook online datasheet:https://bananapi.gitbooks.io/bpi-open-debugger-burn-board/content/en/

BPI 4.0 customized Server

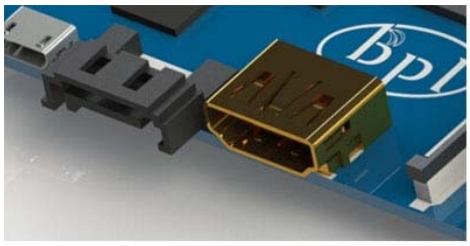
Having been doing R&D in embeded systems for more than 12 years. Our experienced teams are able to help you to carry out your dream. Whether you want to customize banana pi or want to design a computer from scratch, we got you covered. Also, our modern ISO factory spans over 10,000 square meters can help you mass manufacture products to hit the market

Our factory:Sinovoip In order to meet the companys development needs, and further production capacity and product quality. Sources Communication shareholders decided to invest in new plant to build their own, the new factory site is located in manholes and covers an area of more than 10000 square meters,equipped with full range of production equipment and high quality technical management personnel . We have complete SMT production lines, plug-ins production line, assembly line, production line testing.

- your Idea, we will help you optimize and design.
- your Design, we will help you bring it to live.
- your Product, we will help you mass produce it.

Customize Pi

If you want to tailor your Banana pi to your specific use or to minimize the cost for mass production purpose, you are coming the right place. We provide the customization service of banana pi such as remove/add headers or connectors,change component layout,add/remove components,change interfaces etc.

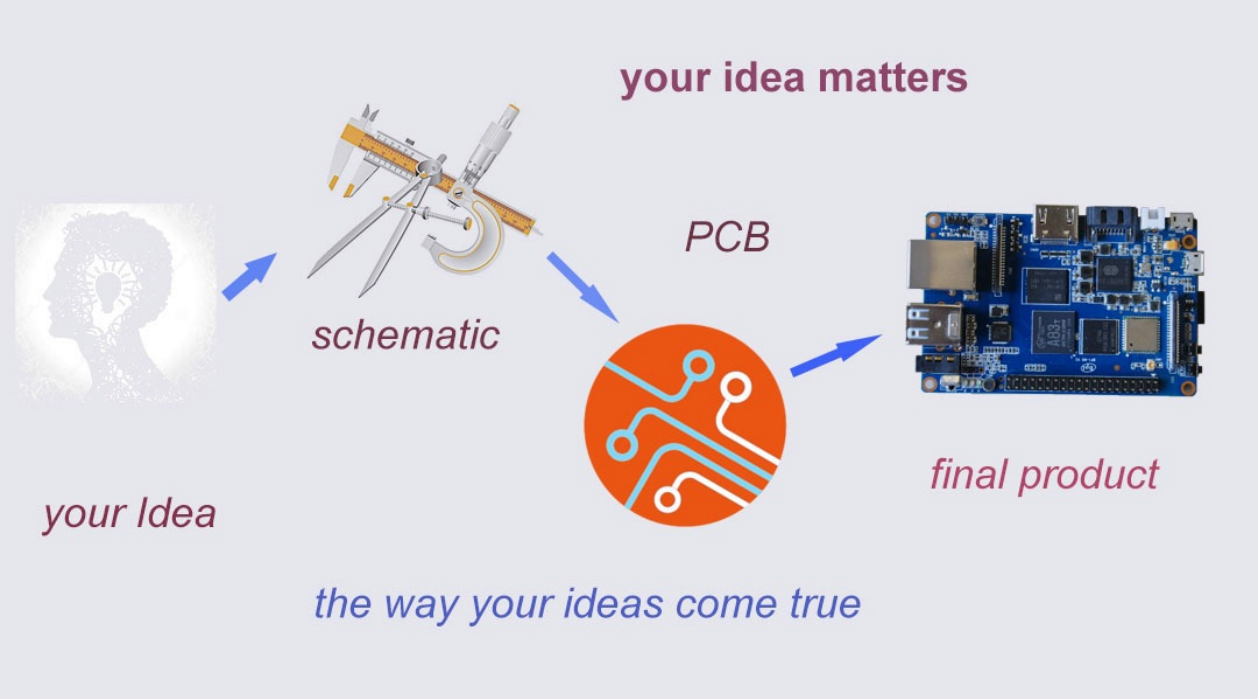


add/remove headers or connectors

add peripheral converter

Start from scratch (ODM)

An idea flashes through your mind in your dreams or a solution bearing in your mind for a long time, which you think would turn out to be great gadget to hit the market, but you are worrying about how to start and realize it without R&D and manufacturing, now that's no longer a trouble to you. Taking advantage of our expertise,we provide full ODM service for you. We let you have your sample products from scratch within 45 days. Don't wait,come to realize your dreams.



Have a prototype (OEM)

You are an expert, you designed a wonderful device that most people would want to have it, you knew it quite well that your success is just around the corner. The only last step is to produce it,but without manufactruing capability..., no problem, let us carry you through. Our 13 years of SCM experience and mass manufacturing facilities enable you free from quality issue,delivery...