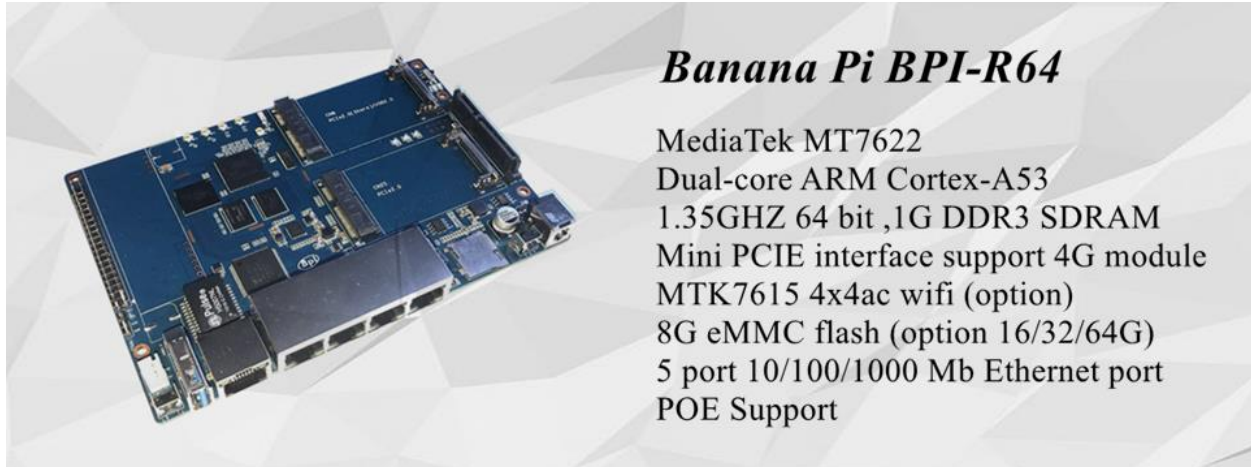


# Banana Pi BPI-R64

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The Banana Pi R64 is a router based development board, which can run on a variety of open source operating systems including OpenWrt, Linux. It has 4 Gigabit LAN ports, 1 Gigabit WAN, and AC wifi AP function. use 64 bit chip design.



**Note: this board doesn't have HDMI interface**

## MTK MT7622

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Highly integrated 4x4 802.11n and Bluetooth 5.0 platform with dedicated Network Accelerator [MediaTek MT7622](#) is the world's first with 4x4n 802.11n/Bluetooth 5.0 system-on-chip designed and built for premium networking devices across several applications including routers/repeaters, home automation gateways, wireless audio, and wireless storage. The highly versatile chipset provides a single platform for popular 4X4 dual-band and tri-band routers/repeaters, providing maximum flexibility for manufacturers looking to build top-tier networking devices. The platform pairs high performance and extensively integrated functionality with a cost-effective approach.

The MT7622 contains MediaTek's Adaptive Network technology that allows for easy setup, network self-healing, roaming, band steering, Smart quality of service, advanced security and more. For audio and voice control applications, essential audio interfaces such as I2S, TDM and S/PDIF are included. And for Home Automation Gateways there is a rich array of slow I/O in addition to the integrated Wi-Fi, Bluetooth and Zigbee co-existence.

Powered by a 64-bit dual-core ARM Cortex-A53 processor clocked at 1.35GHz, the MT7622 provides a host of advanced connectivity options like SGMII/RGMII, PCIe, and USB, and 4X4 802.11n FEM integration. Extending the platform with 802.11ac to meet additional markets is simply done via MT7615 SoC.

The MT7622 introduces several best-in-class features such as Bluetooth 5.0 and a dedicated Network Accelerator engine with the MediaTek Wi-Fi Warp Accelerator, storage accelerator (SATA 3.0/eSATA Gen2) and HNAT HQoS calculations are offloaded from the CPU, lowering overall power-use and freeing up resources to avoid any potential slow-downs.

The advantage of the MediaTek Wi-Fi Warp Accelerator is two-fold. Firstly it connects the Gigabit+ class 802.11ac networking through to the Gigabit switch/WAN connection via multi-Gigabit internal pathways, ensuring no bottleneck. Secondly, its specialized design not only offloads the CPU from many-user throughput and QoS calculations, it does so at lower power. The result is the MediaTek

Wi-Fi Warp Accelerator maintains a sustained high-performance when even supporting multiple, simultaneous heavy users.

Integrated Bluetooth allows for a direct, local wireless connection via App for easy configuration of the router/Wi-Fi settings. The latest Bluetooth 5.0 quadruples range and doubles speed versus previous 4.x technologies, allowing new and innovative possibilities.

## Key Features

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- MediaTek MT7622, 1.35GHz 64 bit dual-core ARM Cortex-A53
- 1G DDR3 SDRAM
- Mini PCIE interface support 4G module
- built-in 4x4n 802.11n/Bluetooth 5.0 system-on-chip
- MTK7615 4x4ac wifi (option)
- support 1 SATA interface
- MicroSD slot supports up to 256GB expansion
- 8G eMMC flash (option 16/32/64G)
- 5 port 10/100/1000 Mb Ethernet port
- (1) USB 3.0
- Slow I/O: ADC, Audio Amplifier, GPIO, I2C, I2S, IR, PMIC I/F, PWM, RTC, SPI, UART
- POE function support

## Getting Start

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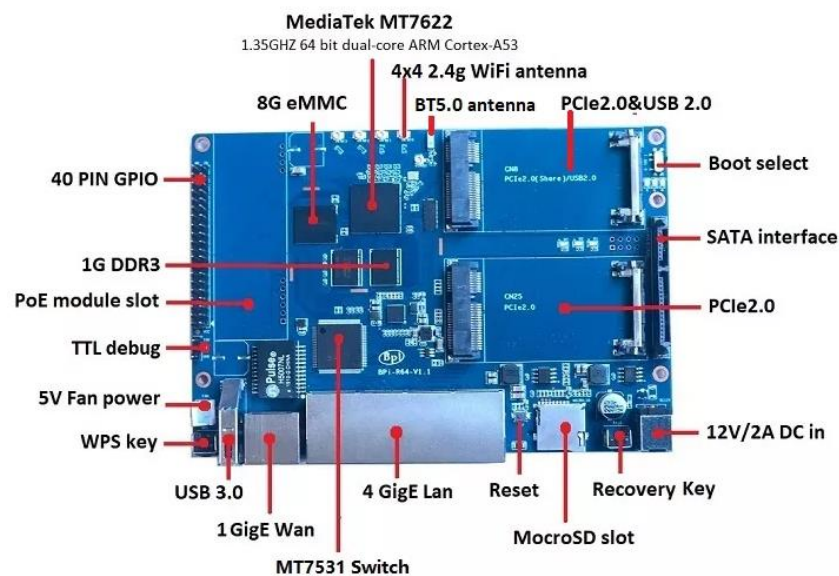
Read more for development : [Getting Started with R64](#)

Frank wiki : <http://fw-web.de/dokuwiki/doku.php?id=en:bpi-r64:start>

## Hardware Revision

### Hardware interface

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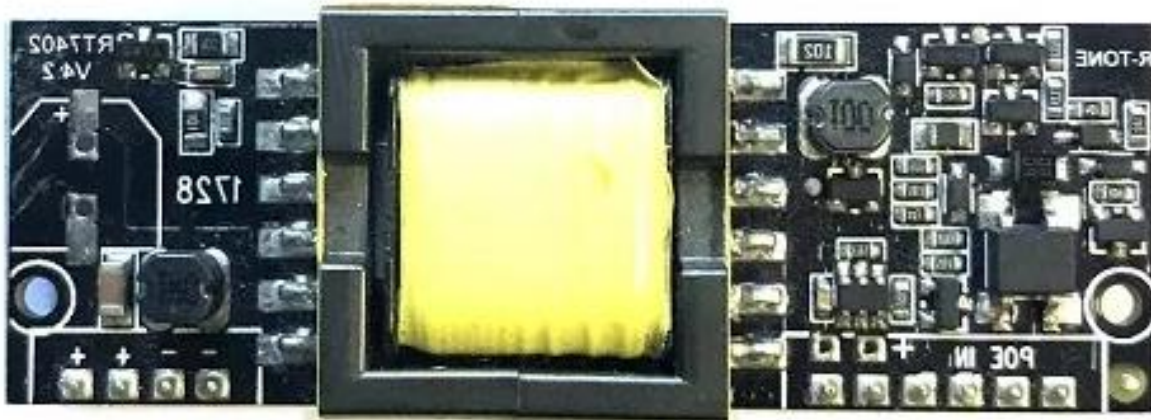
## Hardware spec

HardWare Specification of Banana pi BPI-R64	
CPU	MediaTek MT7622, 1.35GHZ 64 bit dual-core ARM Cortex-A53
SDRAM	1 GB DDR3
SATA	support 1 SATA interface
GPIO	40 Pins Header, 28xGPIO, some of which can be used for specific functions including UART, I2C, SPI, PWM, I2S.
On board Network	5 10/100/1000Mbps Ethernet
Wifi	built-in 4x4n 802.11n (800Mbps) sysem-on-chip and MTK7615 4x4ac wifi Module (1733Mbps) (option)
Bluetooth	Bluetooth 5.0 system-on-chip

On board Storage	MicroSD \ (TF) card,8GB eMMC onboard
mini PCIE	1 mini pcie interface for 4G
USB	1 USB 3.0 host
Buttons	Reset button
Leds	Power status Led and RJ45 Led
IR	PIN define with GPIO
DC Power	12V/2A with DC in
POE	support POE module interface,can add POE module
Sizes	148 mm × 100.5mm
Weight	100g

## PoE support

we design PoE function for BPI-R64 ,so easy to add PoE module to support PoE function,PoE modue can support IEEE 802.3bt PoE standard ,Max support 12V/3A to power BPI-R64



more PoE module spec

[BPI-7402 IEEE 802.3at PoE module](#)

## 4G support

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1, use pcie interface standard module ,and use SIM card slot onboard

2,use 4G extend module via USB port

- USB 4G module : [http://wiki.banana-pi.org/4G\\_module\\_via\\_USB](http://wiki.banana-pi.org/4G_module_via_USB)

## BPI-MT7615 802.11 ac wifi 4x4 dual-band

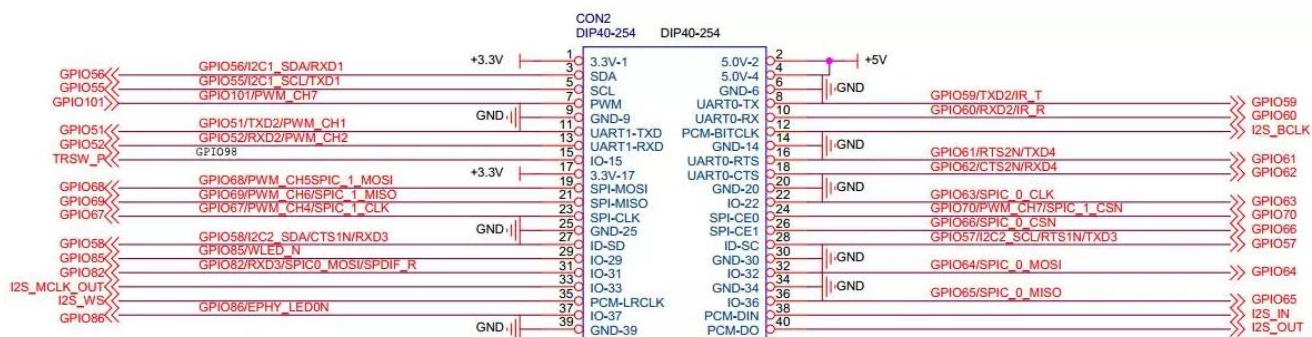
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we have design a MT7615 802.11 ac wifi module ,can use on BPI-R64

MT7615 is a highly integrated Wi-Fi single chip which support 1733 Mbps PHY rate,It fully compies with IEEE 802.11ac and IEEE802.11 a/b/n standards,offering feature-rich wireless connectivity at high standards,and delivering reliable,cost-effective throughput from and extended distance.

[BPI-MT7615 802.11 ac wifi 4x4 dual-band module](#)

## BPI-R64 GPIO Pin define



## Resources

### Source code

- BPI-R64 Linux BSP(kernel 4.19):<https://github.com/BPI-SINOVOIP/BPI-R64-bsp-4.19>
- BPI-R64 Linux BSP(kernel 4.4) : <https://github.com/BPI-SINOVOIP/BPI-R64-bsp>
- frank github(kernel 5.4): <https://github.com/frank-w/BPI-R2-4.14/tree/5.4-r64-dsa>
- OpenWRT: <https://github.com/openwrt/openwrt/tree/master/target/linux/mediatek/mt7622>

### Documents

- BPI-R64 schematic diagram  
google <https://drive.google.com/file/d/1QzKmlwgSNbCIXQbqLsTUELJCEPik3VGr/view?usp=sharing>  
baidu cloud link: <https://pan.baidu.com/s/18MEJpr5OTYmySZoyk3bO5Q> pincode: amqt
- BPI-R64 DXF file for case  
deign : [https://drive.google.com/file/d/1\\_YNsdQ9Cv7FVOGrqd6GP0Tu5u2cjLwTA/view?usp=sharing](https://drive.google.com/file/d/1_YNsdQ9Cv7FVOGrqd6GP0Tu5u2cjLwTA/view?usp=sharing)
- MTK 7622 chip : <https://www.mediatek.com/products/homeNetworking/mt7622>
- MTK  
MT7622A\_Datasheet\_for\_BananaPi\_Only : [https://drive.google.com/file/d/1DVEv3bovA8cPt\\_i3Ln7d9IDBjMCGFSE5m/view?usp=sharing](https://drive.google.com/file/d/1DVEv3bovA8cPt_i3Ln7d9IDBjMCGFSE5m/view?usp=sharing)
- MT7622 Reference Manual for Develop  
Board(BPi) : <https://drive.google.com/file/d/1cW8KQmmVpWdGmBd48KNQes9CRn7FEgBb/view?usp=sharing>
- MT7531 switch chip datasheet: <https://drive.google.com/file/d/1aVdQz3rbKWjkdvga8-LQ-VFXjmHR8yf9/view?usp=sharing>
- Banana Pi BPI-R64 debian Linux boot demo and bootlog:<http://forum.banana-pi.org/t/banana-pi-bpi-r64-debian-linux-boot-demo-and-bootlog/8155>
- Banana Pi BPI-R64 passed AWS  
Greengrass : <https://devices.amazonaws.com/detail/a3G0h000000OvObEAK/Banana-Pi-R64>
- Bpi-r64 quick start (boot from eMMC):<http://forum.banana-pi.org/t/bpi-r64-quick-start-boot-from-emmc/9809>

- Banana Pi BPI-R64 CE,FCC,RoHS Certification : <http://forum.banana-pi.org/t/banana-pi-bpi-r64-open-source-router-board-ce-fcc-rohs-certification/10094>
- Patchwork/Mailinglist there was a DSA-driver for mt7531 released : <https://patchwork.kernel.org/project/linux-mediatek/list/?submitter=189635>

# Release

## Ubuntu

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- 2019-08-23 update,Ubuntu Server 16.04,This release is for banana pi R64 board, and it is based on kernel 4.19.  
 Fetures Map:  
 Google Drive : <https://drive.google.com/open?id=1zrOSS2QJPirSwoK5yJFx10SiOtxRjXPt>  
 Baidu Drive : <https://pan.baidu.com/s/1iOtk-OnC9yNTMzdhSeOCJA> (PinCode : ew9c)  
 MD5 : 79fc190def54140dd9bf12b73e263bd0  
 username : root/pi ; password : bananapi  
 Forum Pthread:<http://forum.banana-pi.org/t/bpi-r64-ubuntu-16-04-aarch64-linux-lite-debian-10-buster-lite-demo-images-release-2019-08-23/9759>

## Debian

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- 2019-08-23 update,Debian 10 buster lite,This release is for banana pi R64 board, and it is based on Debian 10 Buster Lite Operation system with kernel 4.19.  
 Fetures Map:  
 Google Drive : <https://drive.google.com/open?id=1p4WImHkLtdSYGRV5jtMdfYHm5PD4dl-q>  
 Baidu Drive : [https://pan.baidu.com/s/1hVQj-1\\_rYc74QQ1Z4WoiQ](https://pan.baidu.com/s/1hVQj-1_rYc74QQ1Z4WoiQ) (PinCode : g1j5)  
 MD5 : fa3f6a7f7a4bcf2c5a8072301cf8c268  
 username : root/pi ; password : bananapi  
 Forum Pthread:<http://forum.banana-pi.org/t/bpi-r64-ubuntu-16-04-aarch64-linux-lite-debian-10-buster-lite-demo-images-release-2019-08-23/9759>
- 2018-12-11 update This release is for banana pi R64 board which is based on Mtk 7622, Debian 8 AARCH64 is based on kernel 4.4.92  
 Features Map: [http://wiki.banana-pi.org/Getting\\_Started\\_with\\_R64](http://wiki.banana-pi.org/Getting_Started_with_R64)  
 Google  
 Drive : <https://drive.google.com/open?id=1Xnz327Mm24WoVwAsj4yPPek09bP3yv7P>  
 Baidu Drive : <https://pan.baidu.com/s/1AdCM9ITuWP9oXiOE2qGsDw>  
 md5sum : 4b43980375c3f9692c1f0585ca6b541a  
 discuss on forum:<http://forum.banana-pi.org/t/banana-pi-bpi-r64-new-image-debian-8-11-aarch64-release-2018-12-11/7447>

## AArch64 Linux

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- 2019-08-23 update,AArch64 Linux lite,This release is for banana pi R64 board, and it is based on kernel 4.19.  
 Fetures Map:  
 Google Drive : [https://drive.google.com/open?id=1x7\\_lu1D9jJGvAExdNZGDVGuv7CbDp4ep](https://drive.google.com/open?id=1x7_lu1D9jJGvAExdNZGDVGuv7CbDp4ep)

Baidu Drive : [https://pan.baidu.com/s/15X6XtRuab08\\_N2T0vgoVOQ](https://pan.baidu.com/s/15X6XtRuab08_N2T0vgoVOQ) (PinCode : j4f7)

MD5 :ed579320359fdc471eeaf37f98d5874d

username : root/pi ; password : bananapi

Forum Pthread:<http://forum.banana-pi.org/t/bpi-r64-ubuntu-16-04-aarch64-linux-lite-debian-10-buster-lite-demo-images-release-2019-08-23/9759>