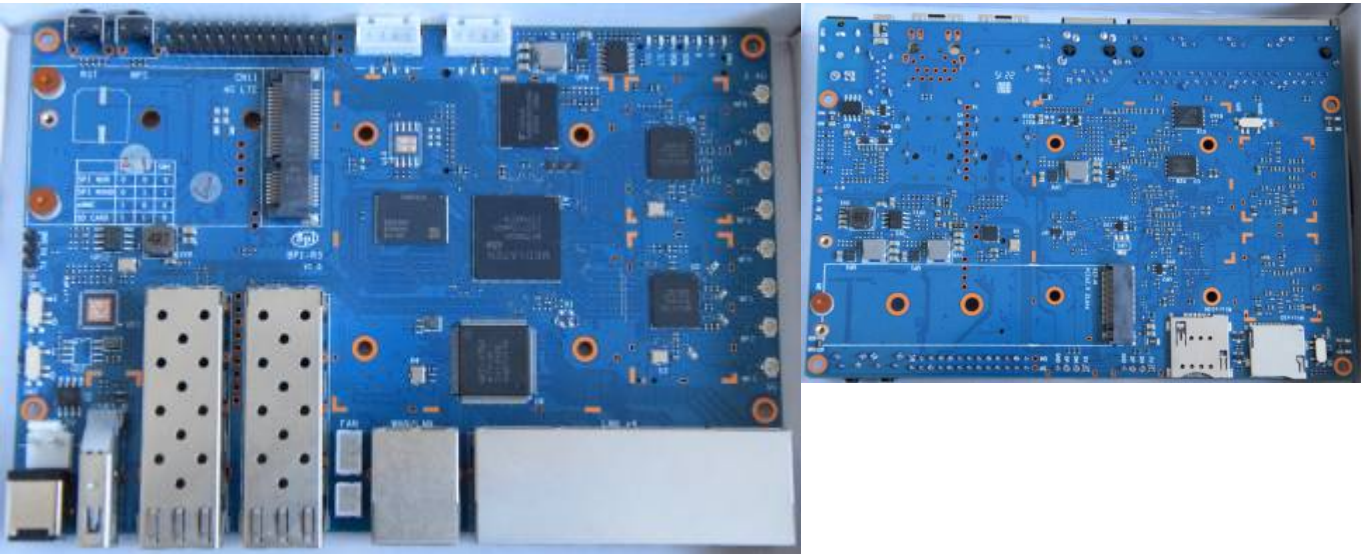


# BananaPi R3

[https://wiki.banana-pi.org/Banana\\_Pi\\_BPI-R3](https://wiki.banana-pi.org/Banana_Pi_BPI-R3)

## Hardware

- mt7986a SoC
- mt7531 Ethernet-switch



## bootmedium

- SD / eMMC sharing 1 mmc-controller in SoC
  - SD 4bit bus, eMMC 8bit
  - switched first 4 data-lanes by sw6 (bottom)
- SPI NAND/NOR sharing SPI0-Bus
  - CS switched by sw5

sw2 on top of board near debug-uart chooses between SPI and MMC

x: Don't care

Jumper setting	SW1	SW2	SW5	SW6
SPIM-NOR	Low	Low	Low	x
SPIM-NAND	High	Low	High	x
eMMC	Low	High	x	Low
SD	High	High	x	High

## Network connections

gmac1 - - - (p6)mt7531(P1-4) - -LANx4  
(P0) - - - -WAN

```
(p5)---right SFP slot
gmac2---left SFP slot
```

<https://forum.banana-pi.org/t/bpi-r3-information/12897/4>

## SFP

We have both sfp recognized and working

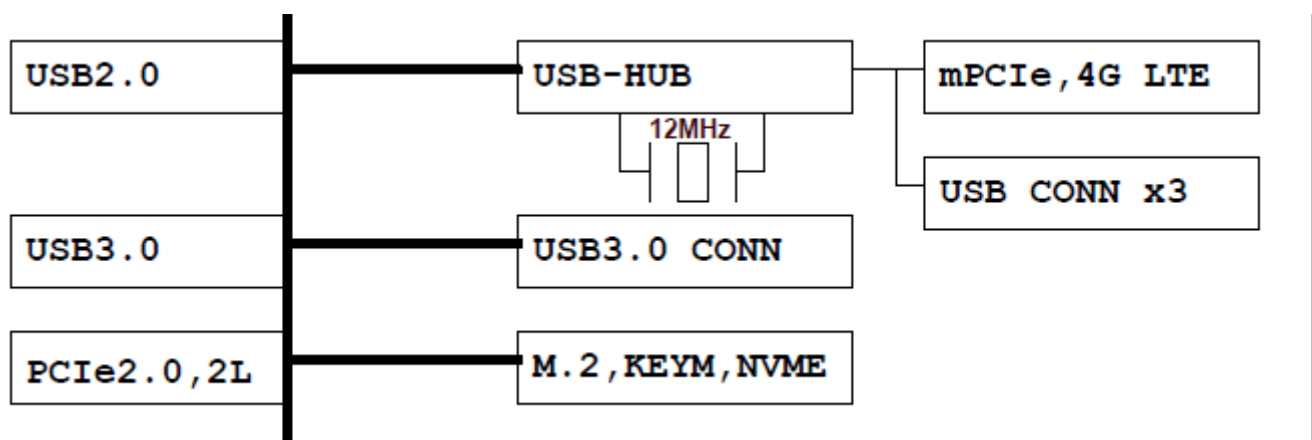
```
mount -t debugfs none /sys/kernel/debug/
cat /sys/kernel/debug/sfp1/state
```

## WIFI

Firmware: <https://git.kernel.org/pub/scm/linux/kernel/git/firmware/linux-firmware.git/tree/mediatek>

## WLAN

## USB / PCIe



mPCIe slot is usb-only with SIM connector (bottom of board). PCIe is mapped to m.2 key-m slot for nvme SSD

Sata possible via M.2 KEY-M 2lane interface on bottom side of board

I tested mpcie slot with an em7455 [LTE](#) module (+key b adapter)

## GPIO

## gpio

# Software

## partition layout

32MB kernel/256MB root:

gpt\_sd-20220216.bin

create own partition table: (currently i try to port to python3, but get crc error, so only python2-support):

[https://github.com/frank-w/BPI-R3-bsp/tree/r3-atf/tools/mediatek/gpt\\_editor](https://github.com/frank-w/BPI-R3-bsp/tree/r3-atf/tools/mediatek/gpt_editor)

```
(cd tools/mediatek/gpt_editor/; python mtk_gpt.py --i example/mt7986-sd.json  
--o GPT_SD)
```

Created a gpt with 100mb kernel+6GB root partition with an python2 venv

[https://github.com/frank-w/BPI-R3-bsp/blob/r3-atf/gpt\\_sdmmc\\_100m6g.img](https://github.com/frank-w/BPI-R3-bsp/blob/r3-atf/gpt_sdmmc_100m6g.img)

## atf / u-boot

### U-Boot

Daniels code: <https://github.com/dangowrt/arm-trusted-firmware/tree/mtksoc-v2.6/>

<https://git.openwrt.org/?p=openwrt/staging/dangole.git;a=shortlog;h=refs/heads/r3-mt7986>

## linux

[patches for mt7986](#)

Own repo: <https://github.com/frank-w/BPI-R2-4.14/commits/5.19-r3>

```
./build.sh importconfig  
./build.sh #build kernel
```

Then copy bpi-r3.itb to card and start from uboot with commands listed above (setenv, fatload, bootm)

## openwrt

<https://git.openwrt.org/?p=openwrt/staging/nbd.git;a=tree;f=target/linux/mediatek/patches-5.15;hb=HEAD>

<https://git.openwrt.org/?p=openwrt/staging/dangole.git;a=shortlog;h=refs/heads/r3-mt7986>

Build instructions: <https://forum.banana-pi.org/t/banana-pi-r3-bsp-source-code/14257/2>

## debian

```
root@bpi-r3:~# date -s "2022-09-18 18:02:00+0200"
root@bpi-r3:~# ip link set lan4 up
root@bpi-r3:~# ip addr add 192.168.0.19/24 dev lan4
root@bpi-r3:~# ip route add default via 192.168.0.10
root@bpi-r3:~# apt update
root@bpi-r3:~# apt install pciutils usbutils traceroute iperf3 net-tools
psmisc wget curl
```

## issues

V1.0:

- reset switch low/pressed when card in m2 slot ([link](#))

V1.1:

- wifi is not recognized when debug-uart connected ([link](#))
  - bpi reports only affects profilic adapters, ch340,cp2102,FT4232 are ok ([link](#))
- reset-bug still there
  - is reported to be fixed in v1.2 (untested)
- dual-nor (no nand) reported by 1 user [link](#)

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<https://wiki.fw-web.de/> - **FW-WEB Wiki**

Permanent link:

<https://wiki.fw-web.de/doku.php?id=en:bpi-r3:start&rev=1669844871>

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