

# Some Raspberry Pi Alternatives With an Orange Pi 5 Demo

Quentin Barnes  
1/19/22

# Why Alternatives?

- “Unobtainium”
  - Supply problems, Industrial customers
  - I’ve been trying to buy an RPi 4B since last April
- No Raspberry Pi 5 until 2024
- More selection, multiple vendors

# Some Alternative Companies

- Udoo (<https://www.udoo.org/>)
- ODROID (<https://www.hardkernel.com/>)
- Libre Computer (<https://libre.computer/>)
- ASUS Tinker (<https://tinker-board.asus.com/>)
- Banana Pi (<https://www.banana-pi.org/>)
- Orange Pi (<http://www.orangepi.org/>)

# Markets

Some companies tend to emphasize:

- Low end, hobbyist boards:
  - Libre Computer, Banana Pi, Orange Pi
- Entry/low-power computing boards:
  - Udoo, ODROID
- Embedded commercial/industrial:
  - ASUS

But most have offerings across multiple markets

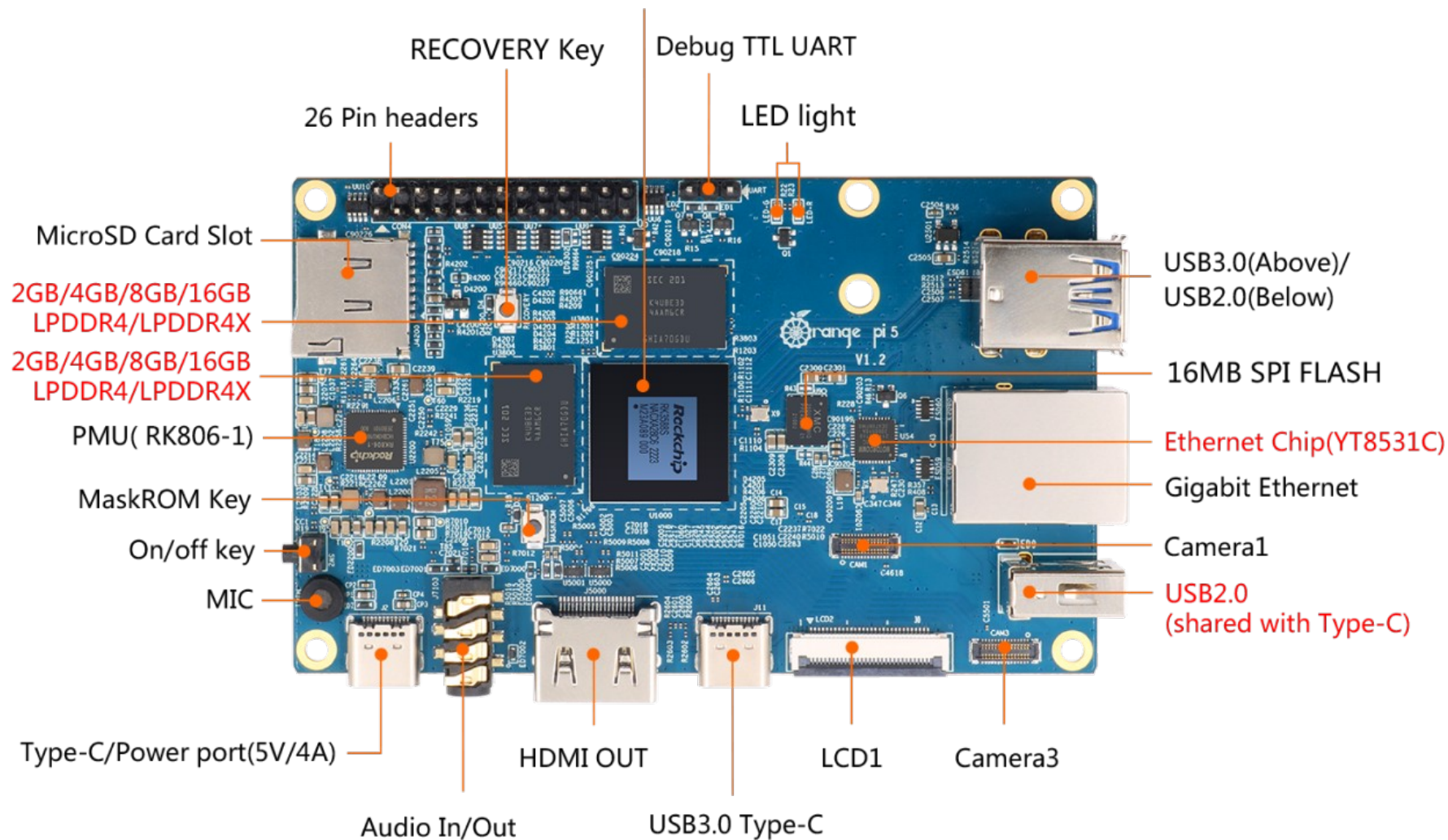
# Orange Pi, the Company

- China-based
- Direct competition to Raspberry Pi
- Open hardware and software
- May not be hardware accessory compatible
  - Need to check each device
  - HATs (Hardware Attached on Top) not compatible

# Orange Pi 5

- Light Desktop Computer
- Powerful ARM Cortex CPU (8 cores, up to 2.4GHz)
- Powerful Graphics (2D/3D engine)
  - Multiple displays, 8K (7680x4320) resolution @ 60Hz
- Up to 32GB on-board RAM
- PCIe M.2 socket for SSD or peripherals
- Gigabit Ethernet, but no on-board WiFi or Bluetooth

Rockchip RK3588S/2.4GHz  
( 64 bit ARM<sup>®</sup> Quad Core CortexA76+Quad Core CortexA55 )



62mm

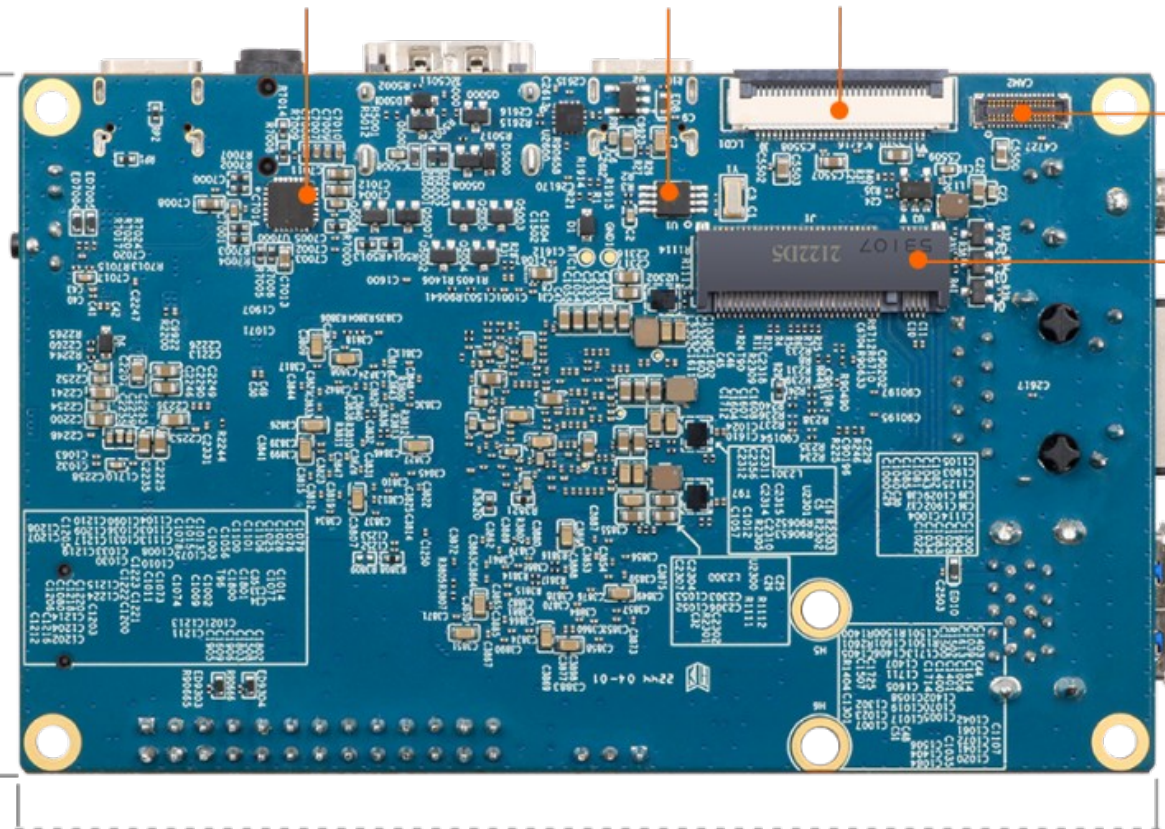
CODEC ( ES8388 )

RTC

LCD2

Camera2

M.2 PCIe2.0  
( Supports 2242 NVMe SSD )



100mm



# Rpi4 vs Opi5 Performance

Test	Orange Pi 5	Pi 4
CPU Blowfish (lower is better)	2.65s	5.24s
CPU CryptoHash (higher is better)	574.49 MiB/s	466.37 MiB/s
CPU Fibonacci (lower is better)	0.5s	1.73s
CPU N-Queens (lower is better)	4.24s	8.74s
CPU Zlib (higher is better)	0.80	0.31
FPU FFT (lower is better)	1.23s	5.52s
FPU Raytracing (lower is better)	2.86s	2.18s
GPU Drawing (higher is better)	2064.13 HiMarks	1708.15 HiMarks

# Costs

- Raspberry Pi 4B 8GB - \$75 MSRP
  - Street prices now around \$175, but trending down
- Orange Pi 5 8GB - \$100
- My setup with power supply, heat sinks, and acrylic case ran me in total (incl shipping+taxes) - \$126
  - Street price for my exact setup now - \$141
- Boards with less RAM much cheaper though

Demo!