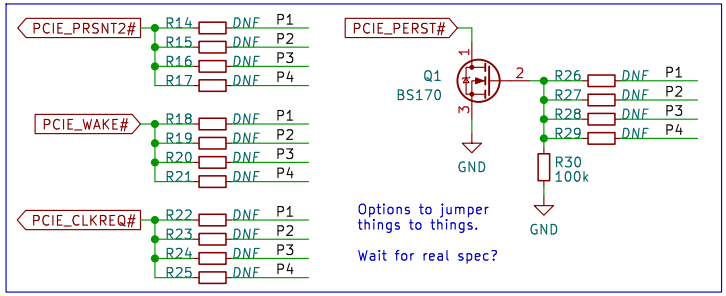
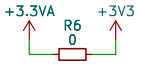
THIS SCHEMATIC IS A REVERSE ENGINEERING WITH GUESSING! IT WORKED WITH 3 PCIe CARDS ON 1 PI5. DO NOT USE FOR ANYTHING SERIOUS!

PCIe EMS R4.0 V1.0, §1.5:
- Reference clock (REFCLK−/REFCLK+), must be supplied by the system (see Section 2.1.1)
- Add−in Card presence detect pins (PRSNT1# and PRSNT2#), required
- PERST#, required
- CLKREQ#, optional
- JTAG, optional
- SMBus, optional
- Wake (WAKE#), required only if the device/system supports wakeup and/or the Optimized Buffer Flush/Fill (OBFF) mechanism
- Power Brake (PWRBRK#), optional
- +3.3 Vaux, optional

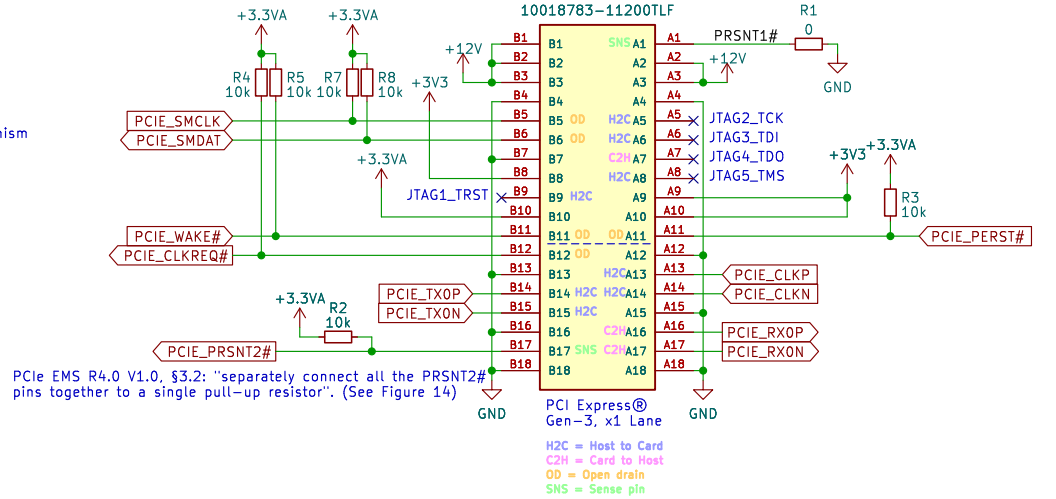
See also: https://en.wikipedia.org/wiki/PCI_Express



+3.3VA=3V3AUX
3V3AUX is an always−on 3V3 used for WAKE#
Doubt the Pi5 supports WAKE, so strap to 3V3



PCIe EMS R4.0 V1.0, §3.2: "the system board must connect PRSNT1# to GND". (See Figure 14)

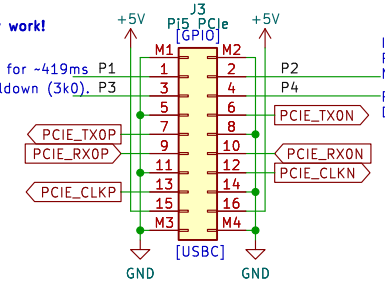


Connector on Pi5: (maybe?) Wurth 687316124422

Pi5 FPC 5V 1A max

Pins 1−4 are sidebands signals are a complete guess.
If the card is ready and powered at Pi5 boot, it'll likely work!

Drives (into 220R, so not pullup?) to 3V3 during reboot for ~419ms P1
Remains low during boot? Does drive out. Doesn't pulldown (3k0). P3

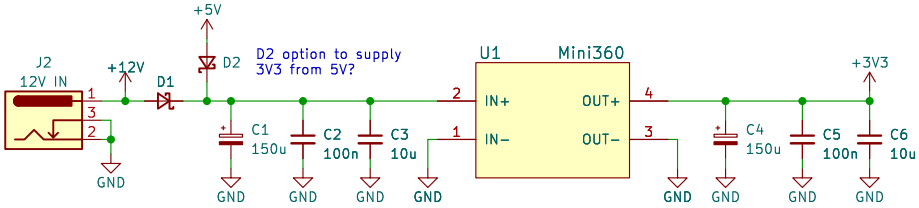


P2
P4
Idles at 3V3.
Pulled up with a 47k resistor.
No kernel message when grounded
Remains low during boot? Does drive out.
Doesn't pulldown (3k0).

CLKa & CLKb have a diff clock of 54 MHz at idle.

Need to add software and enable PCIe DT−overlay.

M1−M4 are bonded in the connector and GND.



Power (75W req.)

+3V3: 3.0A / 1000uF max
+12V0: 5.5A / 2000uF max
+3V3A: 0.4A / 150uF max

Watch 12V current on connector

Pi5 only supplies 5V 1A: 5W max

https://github.com/m1geo/Pi5_PCIe
https://www.george−smart.co.uk
George M1GEO, Chris G8OCV

Sheet: /
File: Pi5_PCIe.kicad_sch

Title: Raspberry Pi 5 PCIe Breakout

Size: A4	Date: 2023−11−07	**Rev: 0.01A**
KiCad E.D.A. kicad 7.0.8−7.0.8~ubuntu22.04.1		Id: 1/1