

Clock generator & Reset fanout

File: clock_gen.kicad_sch

Direct 4-lane PCIe

File: direct_PCl_e.kicad_sch

RC 1-lane and 2-lane PCIe

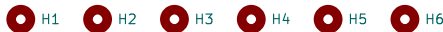
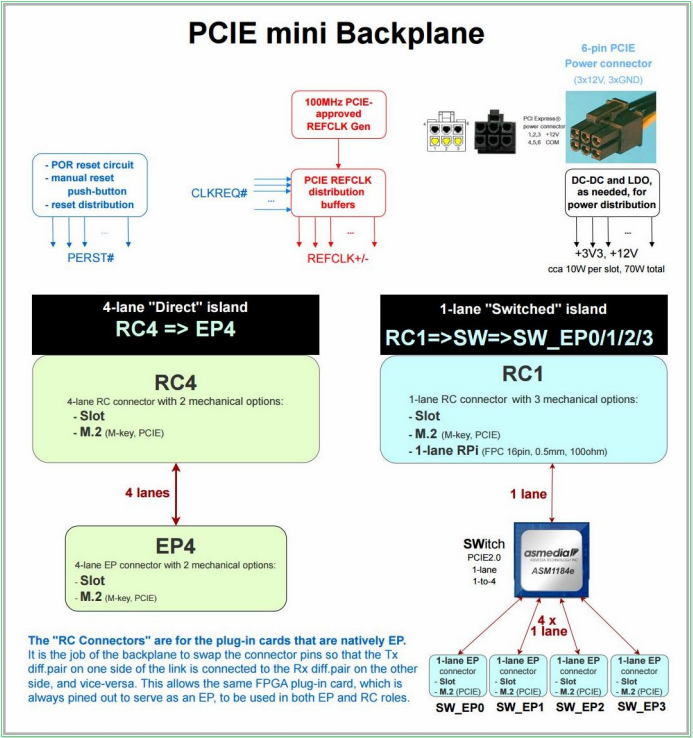
File: RC_4-lanes-PCl_e.kicad_sch

PCIe switch

File: pcie_switch.kicad_sch

Switched 4 x 1-lanes PCIe

File: 4_1-lanes_PCl_e.kicad_sch



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Sheet: /
File: openpci2-backplane.kicad_sch

Title:

Size: A4

Date: 2025-10-20

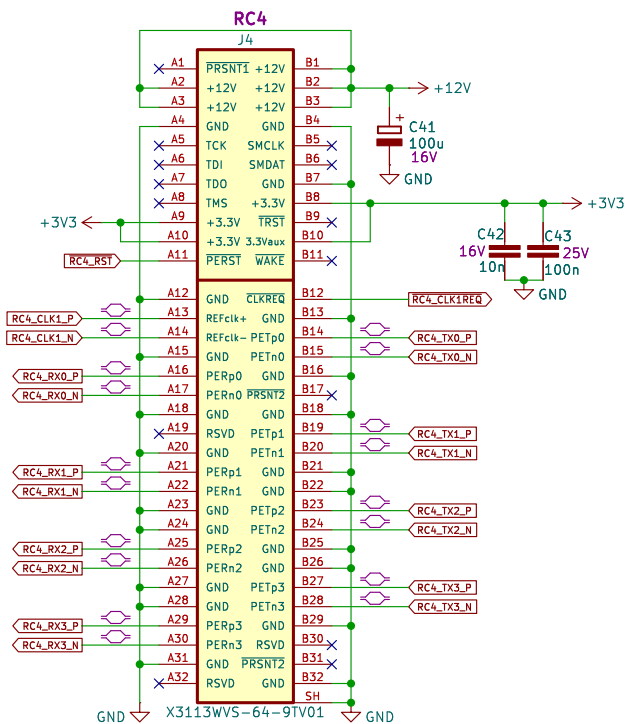
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Rev: r1B1

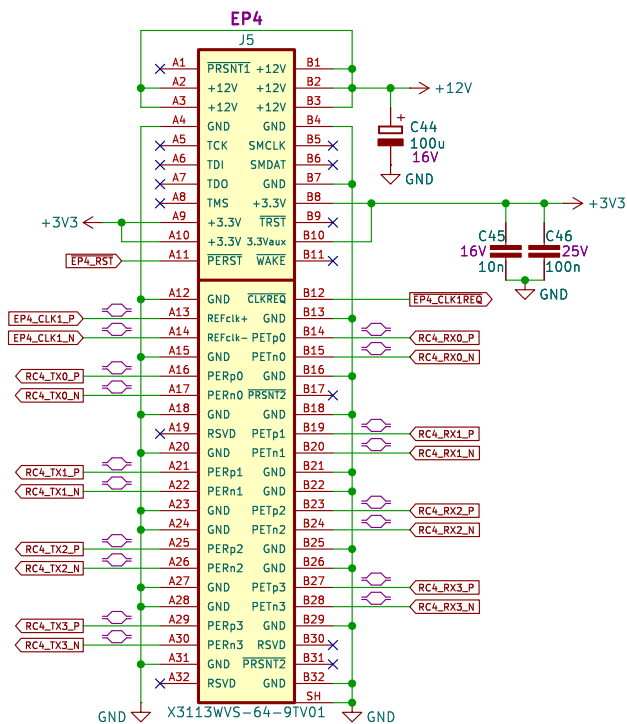
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RC4



EP4



PCIEx1 pinout

Pin	Side B	Side A	Description
1	+12 V	PRSN2#	Must connect to farthest PRSNT2# pin
2	+12 V	+12 V	Main power pins
3	+12 V	+12 V	
4	Ground	Ground	
5	SMBCAT	TP1	SMBus and JTAG port pins
6	SMBCAT	TP2	
7	Ground	TP3	
8	+3.3 V	TP4	Aux power & Standby power
9	TP5	+3.3 V	
10	+3.3 V aux	+3.3 V	
11	PERST#	PERST#	Link reactivation, fundamental reset [25]
Key notch			
12	CLKREQ# [25]	Ground	Clock Request Signal
13	Ground	REFCLK+	Reference clock differential pair
14	HSOp(0)	REFCLK-	
15	HSOn(0)	Ground	Lane 0 transmit data, + and -
16	Ground	HSIp(0)	Lane 0 receive data, + and -
17	HSIn(0)	HSIn(0)	
18	Ground	Ground	

PCI Express x1 cards end at pin 18

Legend	
Ground pin	Zero volt reference
Power pin	Supplies power to the PCIe card
Card-to-host pin	Signal from the card to the motherboard
Host-to-card pin	Signal from the motherboard to the card
Open drain	May be pulled low or sensed by multiple cards
Sense pin	Tied together on card
Reserved	Not presently used, do not connect

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Sheet: /Direct 4-lane PCIe/
File: direct_PCIe.kicad_sch

Title:

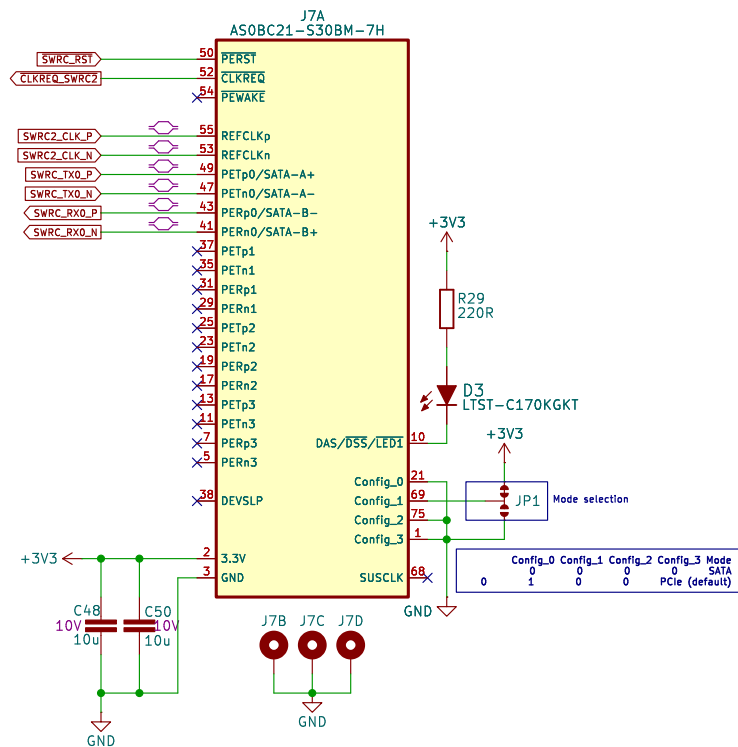
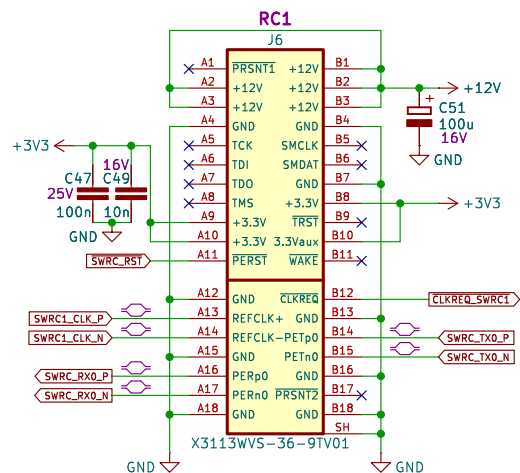
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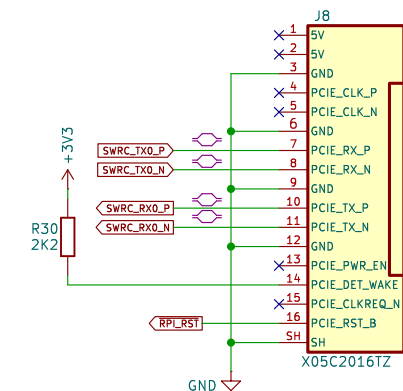
Rev: r1B1

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1-lane PCIe for Root Complex



Raspberry Pi FPC 16-pin connector



As the Root Complex, the Raspberry Pi provides its own reference clock. The rest of the backplane does not need this clock, as all downstream PCIe devices receive their reference clock from the onboard generator (U5).

PCIE_RST_B (pin 16) is an active-low output from the Raspberry Pi, serving as the master reset for the downstream PCIe fabric. This PCIE_RST_B signal is intended to be combined with the board's own reset sources through external logic to generate the final system reset.

2.1. PCIe Signals

The PCIe signals are a single lane of PCIe Gen 2, including CLKREQ and RST_B sideband signals which operate at 3.3V.

2.1.1. Pwr_en pin

This pin is a 3.3V output from the Raspberry Pi to a HAT+ or other add-on board, and signals to the HAT+ to power up any supplies. For example, in the instance of the Raspberry Pi M.2 M Key HAT+, this enables the M.2 3.3V power (which is generated from the Incoming 5V). Provide a 100K low pull on this pin on any HAT+.

2.1.2. DetWake pin

This pin is a 3.3V input to the Raspberry Pi. Pull high to 3.3V either from a resistive divider from 5V (3k6/6k8 giving 2.55k output impedance), or from permanently enabled 3.3V (using a 2.2k resistor). The Raspberry Pi will detect this high pull at boot time, and will automatically probe the PCIe bus. Use the PCIe WAKE# to pull this low

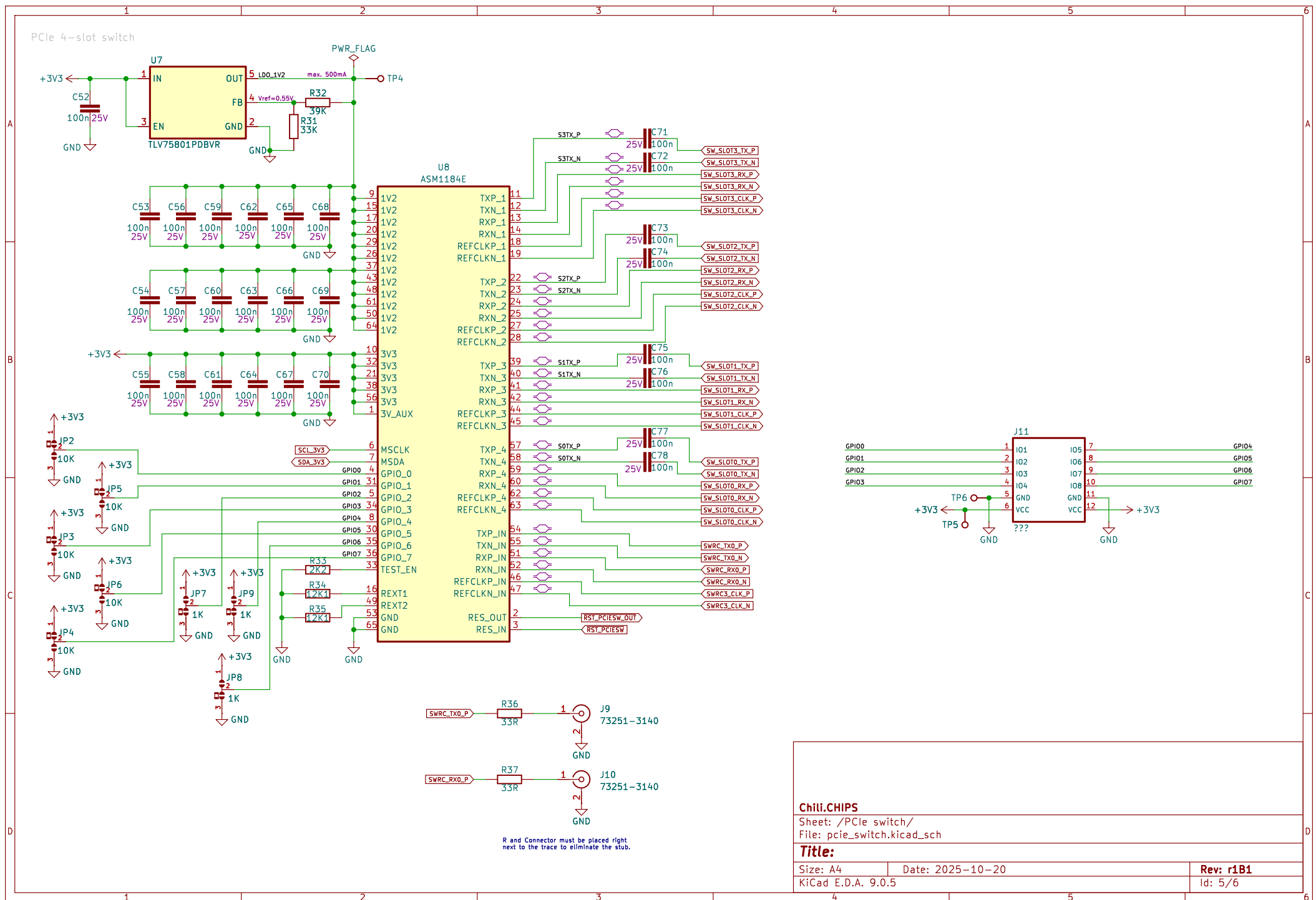
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Sheet: /RC 1-lane and 2-lane PCIe/
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