Jan.27, 2025

PCIE mini Backplane

- POR reset circuit
- manual reset push-button
- reset distribution

PERST#

CLKREQ#

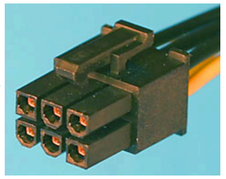
100MHz PCIE-approved REFCLK Gen

PCIE REFCLK distribution buffers

REFCLK+/-

6-pin PCIE Power connector
(3x12V, 3xGND)

PCI Express® power connector
1,2,3 +12V
4,5,6 COM



DC-DC and LDO, as needed, for power distribution

+3.3V, +12V, **70W total**, approx 10W per slot

PCIE network with multiple options for RC and 1-to-4 PCIE Switch

4-lane RC Connector
with 3 mechanical options:
- Slot
- M.2 (PCIE)
- 1-lane RPi (FPC 16pin, 0.5mm, 100ohm)

1 lane this is also the only lane from RPi FPC connector

2 lanes

1 lane

PCIE2.0 1-to-4 Switch

4-lane EP Connector
(2 lanes are not used)
- Slot
- M.2 (PCIE)

1-lane EP Connector
- Slot
- M.2 (PCIE)

4 x 1 lane

1-lane EP Connector
- Slot
- M.2 (PCIE)

1-lane EP Connector
- Slot
- M.2 (PCIE)

1-lane EP Connector
- Slot
- M.2 (PCIE)

1-lane EP Connector
- Slot
- M.2 (PCIE)

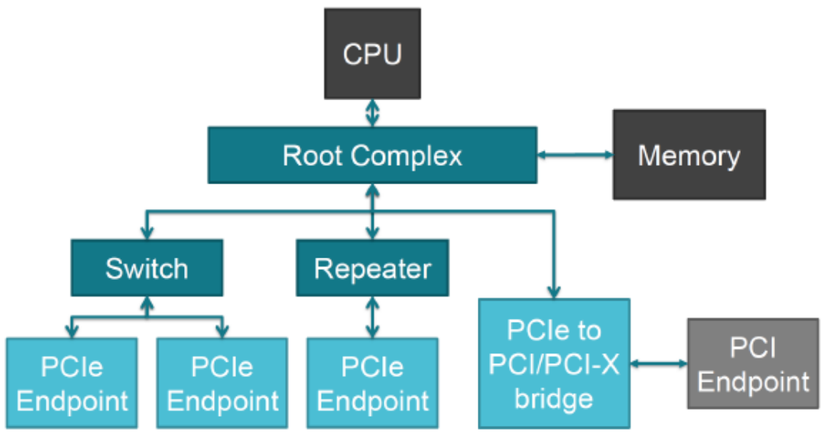
Separate / Isolated direct 4-lane PCIE link

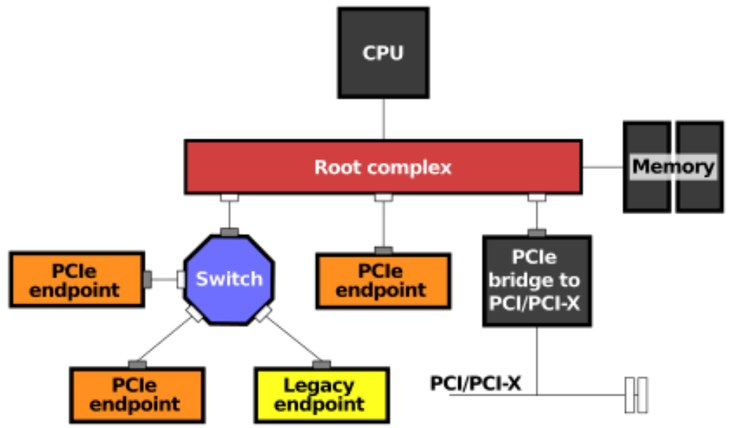
4-lane RC Connector
with only 1 mechanical option: M.2 (PCIE)

4 lanes

4-lane EP Connector
(all 4 lanes are used)
- M.2 (PCIE)

General PCIE topology





PCIEx1 pinout

Pin	Side B	Side A	Description
1	+12 V	~~PRSNT1#~~	Must connect to farthest PRSNT2# pin
2	+12 V	+12 V	Main power pins
3	+12 V	+12 V	
4	Ground	Ground	
5	~~SMCLK~~	~~TCK~~	SMBus and JTAG port pins
6	~~SMDAT~~	~~TDI~~	
7	Ground	~~TDO~~	
8	+3.3 V	~~TMS~~	
9	~~TRST#~~	+3.3 V	
10	+3.3 V aux	+3.3 V	Aux power & Standby power
11	~~WAKE#~~	PERST#	Link reactivation; fundamental reset [25]
Key notch			
12	CLKREQ#[26]	Ground	Clock Request Signal
13	Ground	REFCLK+	Reference clock differential pair
14	HSOp(0)	REFCLK−	Lane 0 transmit data, + and −
15	HSOn(0)	Ground	
16	Ground	HSIp(0)	Lane 0 receive data, + and −
17	~~PRSNT2#~~	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