PEX 8114RDK-R

Hardware Reference Manual

For Board Revision 100

Version 3.2

February 2008

Website:	**www.plxtech.com**
Technical Support:	**www.plxtech.com/support**

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Preface

Notice

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About This Manual

This manual describes the PLX PEX 8114RDK-R, the PEX 8114 Reverse Bridge RDK Board Rapid Development Kit, from a hardware perspective. It contains a description of all major functional circuit blocks on the PEX 8114RDK-R and also is a reference for the creation of software for this product. This manual also includes a complete Bill of Materials and Schematics.

Revision History

Date	Version	Comments
April 2005	1.0	Initial release. Supports Board Revision 001.
April 2005	1.1	Update to support Board Revision 100.
July 2005	1.2	• Added missing greater than/less than symbols for Section 3.3 bullets. • Rewrote Section 3.4.2. • Section 3.5.1, changed capacitor reference to "AC coupling" and clock synthesizer frequency information. • Section 3.5.4, changed referenced pin to 5. • Deleted Section 3.6.1 (PCI CLK) and Section 3.4.3 (RefClk Control). • Removed SW4 and revised most content related to SW5. • Updated Figure 1, Figure 4, and Figure 5. • Removed Figure 7 and renumbered subsequent figures.
April 2006	2.0	• Updated to reflect use of PEX 8114BA device. • Updated Figure 1, Figure 4, and Figure 5. • Section 3.3, changed "SW4, pin 2" reference to "SW5, pin 1." • Section 3.5.1, corrected SW5 pin references (2 places). • Section 3.7.1, changed VTT value to +1.3 to +1.8 VDC. • Updated Bill of Materials and Schematics.
November 2006	3.0	• Updated to reflect use of PEX 8114BB device. • Miscellaneous changes and enhancements throughout manual. • Updated Bill of Materials and Schematics. • Removed references to Non-Transparent mode.
March 2007	3.1	• Updated to reflect use of PEX 8114BC device. • Updated Bill of Materials and Schematics.
February 2008	3.2	• Updated to reflect use of PEX 8114BD device. • Updated Bill of Materials and Schematics.

1   General Information

The PLX PEX 8114RDK-R is a Rapid Development Kit based on the PLX ExpressLane™ PEX 8114 PCI Express-to-PCI/PCI-X Bridge device implementing Reverse Bridge mode. The PEX 8114RDK-R is a complete hardware and software development platform to facilitate getting designs up and running quickly, lowering risk and time-to-market. The PEX 8114RDK-R allows the PEX 8114 bridge device PCI or PCI-X interface to be connected to a Host system slot, by way of a standard PCI/PCI-X board edge connector (the PEX 8114RDK-R is designed to plug into a PCI or PCI-X motherboard slot). In Reverse Bridge mode, the secondary side of the PEX 8114 bridge device is the PCI Express downstream port.
The PEX 8114RDK-R also allows for a single PCI Express adapter to be plugged into the downstream port, by way of a standard PCI Express Card Electromechanical (CEM) slot located on the PEX 8114RDK-R.
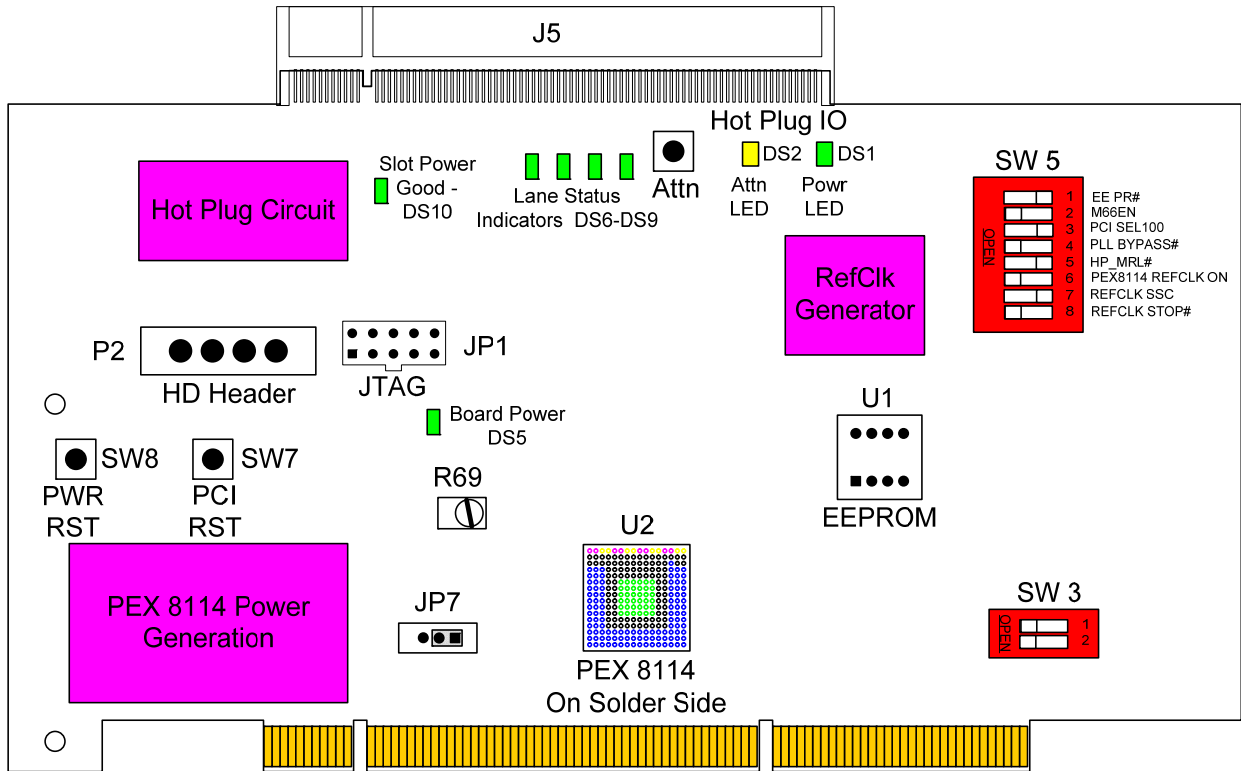
Figure 1. PEX 8114RDK-R – Component Side View

1.1 PEX 8114 Features

- Supports Reverse and Forward Bridging

  Note: The PEX 8114RDK-R is for Reverse Bridge mode designs. For Forward Bridge mode designs, refer to the PEX 8114RDK-F.

- Single PCI Express port capable of x4, x2, or x1 link width

- Single PCI-X Bus segment supporting PCI-X protocol at 64-bit/133 MHz and/or *PCI Local Bus Specification, Revision 3.0*

- Standard 256-ball PBGA package (17 x 17 mm)

- Advanced PCI Express features supported include Advanced Flow Control, Advanced Error Reporting, Integrated Hot Plug, ECRC and Poison Bit, Automatic Polarity, and Lane Reversal

- Fully integrated PCI Express PHY with 8b/10b encoding, hardware link training, and low-power programmable SerDes

- Compliant to the following specifications:

    - *PCI Local Bus Specification, Revision 3.0*
    - *PCI Express to PCI/PCI-X Bridge Specification, Revision 1.0*
    - *PCI Express Base Specification, Revision 1.0a*

1.2 PEX 8114RDK-R Features

- PLX PCI Express-to-PCI/PCI-X bridge device

- Form factor based on *PCI-X Electrical and Mechanical Addendum to the PCI Local Bus Specification, Revision 2.0a*

- Single 64-bit PCI/PCI-X board edge connector for insertion into standard 64-bit PCI or PCI-X motherboard slot

- Single PCI Express slot on secondary side – slot is *PCI Express Card Electromechanical (CEM) Specification, Revision 1.1*-compliant and accommodates PCI Express adapters with slot connector widths up to x16

  Note: Reverse Bridge mode supports a maximum downstream PCI Express link width of x4; however, all PCI Express functions plugged into the downstream slot automatically link train to the largest common link width supported by both devices. The following PCI Express adapter link widths can be accommodated with this RDK – x1, x2, x4, x8, and x16.

- Socketable serial EEPROM for easy configuration

- Lane Status Indicator LEDs for easy visual inspection of PCI Express link and lane status

- Auxiliary ATX four-pin hard-drive connector for additional power requirements

- DIP switches for PEX 8114 hardware configuration

- On-board PCI Express RefClk generator

- On-board probing points

- On-board manual Reset switches

2   System Architecture

The PEX 8114RDK-R assists customers in evaluating PLX Technology's PEX 8114 PCI Express-to-PCI/PCI-X Bridge device, and facilitates early development of customer designs with the PEX 8114. The usage configuration is reverse bridging between a PCI/PCI-X baseboard and a PCI Express add-in board. The PEX 8114RDK-R is designed to showcase all features of the PEX 8114 when operating in Reverse Bridge mode.

The PEX 8114RDK-R's form factor is based on the *PCI-X Electrical and Mechanical Addendum to the PCI Local Bus Specification, Revision 2.0a*. The PEX 8114RDK-R is able to plug into a standard +3.3V PCI or PCI-X slot of a Host system and supports PCI/PCI-X traffic of up to 64-bit transfers, at up to 133 MHz. (Refer to Figure 2.) The PCI Express interface is provided by an x16 PCI Express straddle-mount slot connector, into which a PCI Express board can be inserted. Only the first four lanes of the slot are routed to the PEX 8114, and each lane is capable of up to 2.5 Gbps. The PEX 8114RDK-R appears to the Host as a PCI-to-PCI bridge. A PCI Express board plugged into the PEX 8114RDK-R appears to the Host to be sitting on a PCI Bus behind a PCI-to-PCI bridge. The Host system can treat the PCI Express board as a standard PCI board. The PEX 8114RDK-R supports PCI Express Hot Plug.

PEX 8114RDK-R power, as well as +3.3 VDC to the PCI Express slot connector, is provided through the PCI/PCI-X board edge connector. Power to the PCI Express straddle-mount slot connector for +12 VDC, up to 2.3A draw, can be from an on-board +5 VDC to +12 VDC converter that draws from +5 VDC provided by the PCI/PCI-X board edge connector. For heavier loads, +12 VDC can be provided from an ATX supply, by way of a standard four-pin hard-drive header.

Note: This voltage converter is not operable on current versions of the PEX 8114RDK-R. PCI Express +12 VDC must be obtained from the 4-pin hard-drive header.

The PEX 8114RDK-R has a Hot Plug interface device on the PCI Express port to support PCI Express Hot Plug.
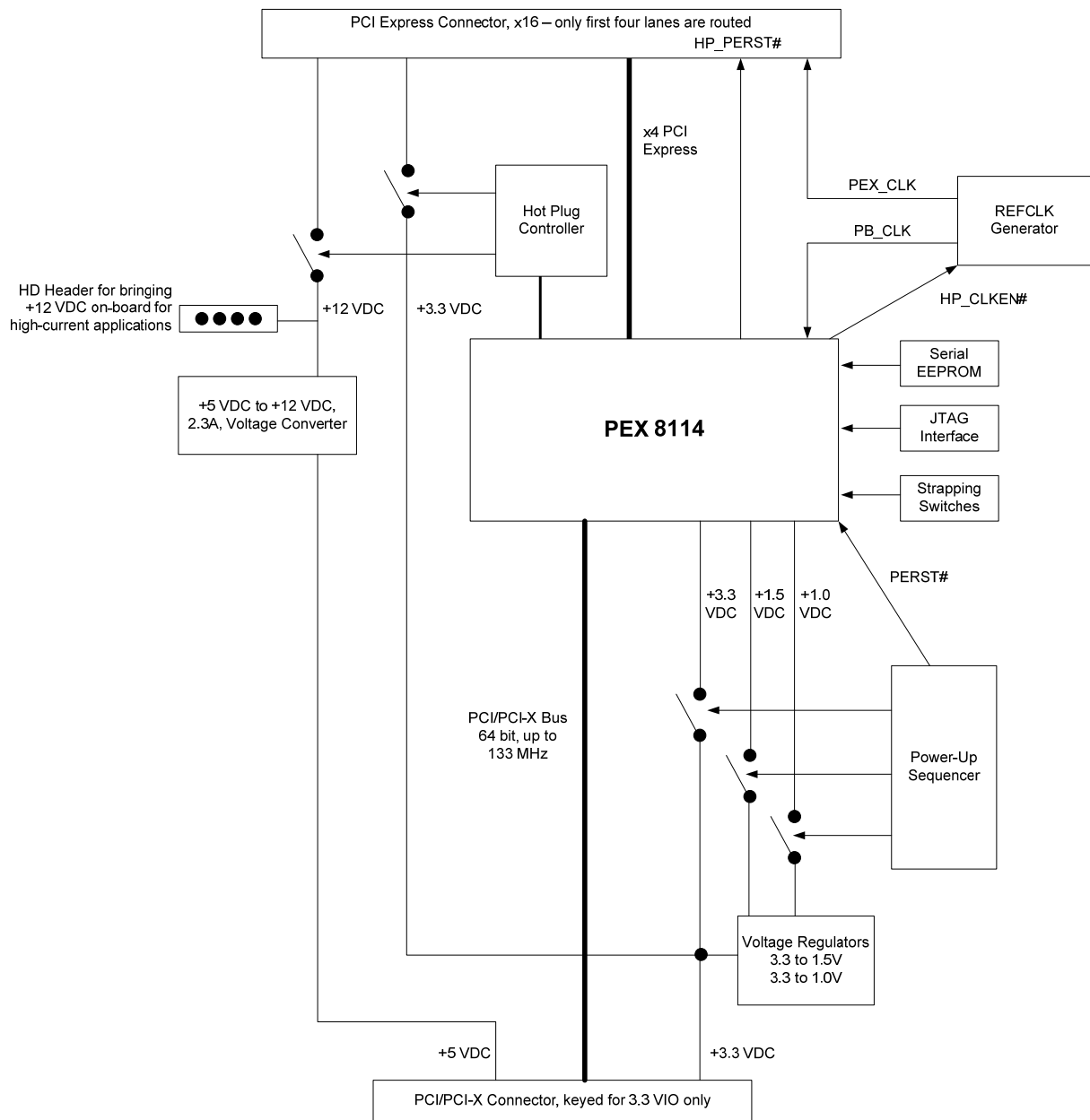
Figure 2. PEX 8114RDK-R Functional Block Diagram

3 Hardware Architecture

There are several subsystems on the PEX 8114RDK-R. Among them are a power system that powers the PEX 8114, a Hot Plug circuit for the PCI Express straddle-mount slot connector, a Reference Clock generator, and controls and indicators. The following sections describe each PEX 8114RDK-R subsystem.

3.1 PEX 8114 Bridge Device

The PEX 8114 is housed in a 17 x 17 mm 256-ball PBGA package. Ball pitch is 1.0 mm. No additional cooling is required.

3.2 JTAG Interface

The PEX 8114 has a JTAG interface, which is connected to a 2 x 5 header. (Refer to Figure 3.)

There is no "standard" JTAG header pin arrangement; therefore, JTAG header type and pin assignments are somewhat arbitrary. The header and pin assignment chosen for the PEX 8114RDK-R is compatible with the Corelis JTAG single TAP cable (AS00790050-A0).

Pin 1 - TRST#
Pin 3 - TDI
Pin 5 - TDO
Pin 7 - TMS
Pin 9 - TCK
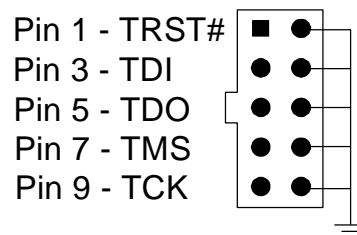
Figure 3. JTAG (JP1) Header (Viewed from Top)

3.3 Serial EEPROM Interface

The PEX 8114 has an SPI EEPROM interface, which can be used to load Configuration data from a serial EEPROM at power-up. This interface is connected to an 8-pin DIP socket (U1), which houses the serial EEPROM. Switch SW5 – pin 1 – indicates to the PEX 8114 that the serial EEPROM is present when this switch is closed. (Refer to Figure 5.)

1 KB of serial EEPROM storage is sufficient.

If the application requires Expansion ROM space, up to a 64-KB serial EEPROM can be used. The serial EEPROM must complete loading within 10 ms, and must be capable of being clocked at 7.8 MHz (the clock frequency output by the PEX 8114). Serial EEPROM I/O signaling levels must meet the following values, to be compatible with the PEX 8114 TTL I/O levels:

- $V_{IL} \leq 0.4V$
- $V_{IH} \geq 2.4V$
- $V_{OL} \leq 0.8V$
- $V_{OH} \geq 2.0V$

The Atmel AT25xxxA family of serial EEPROMs is one possible family of serial EEPROMs that can be used. The PEX 8114RDK-R includes a pre-programmed AT25640A serial EEPROM.

3.3.1 Serial EEPROM Contents

Refer to the *PEX 8114BC/BD Data Book*, Appendix A, "Serial EEPROM Map."

3.4 Strapping Switches

The PEX 8114RDK-R has two DIP switches – SW3 and SW5 – that are used to control various PEX 8114RDK-R configurations.

3.4.1 Switch SW3 – PCIXCAP Control

Switch SW3 has two switches, which determine the PCI/PCI-X board edge connector PCIXCAP pin value. This signal is also passed to the PEX 8114, to communicate expected PCI/PCI-X Bus speed. Figure 4 illustrates the switch, a table listing the PCIXCAP switch combinations, and the circuit used.

		PCIXCAP[2:1] CLOSED = 1, OPEN = 0		
PCI M66EN	PCI SEL100	X 1 (GND)	1 0 (10K to GND)	0 0 (Open)
Low	Low	PCI 33	PCI-X 66	PCI-X 133
Low	High	PCI 25	PCI-X 50	PCI-X 100
High	Low	PCI 66	PCI-X 66	PCI-X 133
High	High	PCI 50	PCI-X 50	PCI-X 100
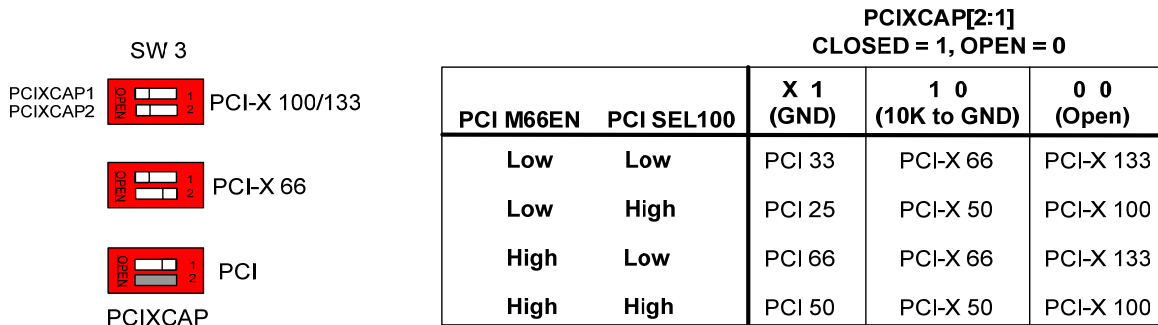
Figure 4. SW3 PCIXCAP Switches

3.4.2 Switch SW5 – Strapping and RefClk Pin Control

Switch SW5 has eight switches, which determine some Strapping ball values to the PEX 8114, some PCI/PCI-X Bus speed control signals, and some RefClk generator control signals. Figure 5 illustrates the SW5 switch assignments, in their default positions.
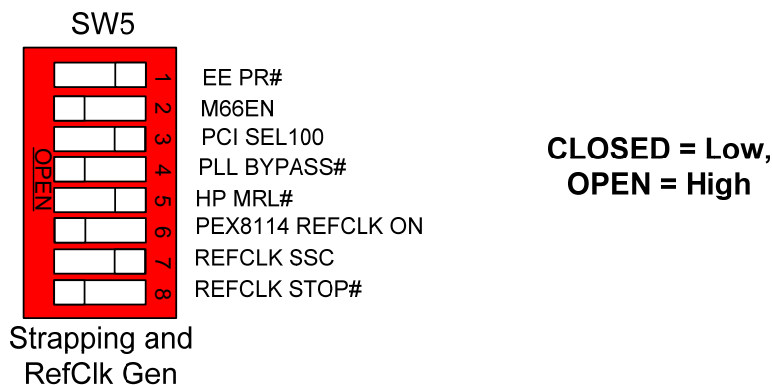
Figure 5. SW5 Strapping and RefClk Generator Switches

3.5 PCI Express Interface

The PCI Express interface is provided by an x16 female straddle-mount slot connector (J5). Only the first four lanes are routed to the PEX 8114. The PCI Express straddle-mount slot connector provides +12 VDC and +3.3 VDC, RefClk, and PERST# to PCI Express add-in boards. The PCI Express lanes are laid out as 100-Ohm, controlled-impedance, stripline-differential pairs. Within pair, trace-length mismatch is not greater than 0.127 mm (0.005 inches). Pair-to-pair, trace-length mismatch is less than 6.35 mm (0.25 inches).

3.5.1 RefClk

PCI Express RefClk is generated on-board by a clock synthesizer, using a 25-MHz crystal for the seed frequency. The PEX 8114RDK-R uses the ICS9FG108G part from Integrated Device Technology, though any comparable synthesizer is sufficient. RefClk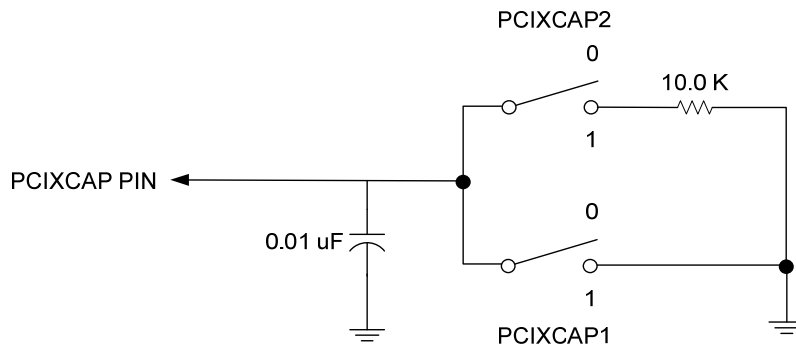 is fanned out to the PEX 8114 and the PCI Express straddle-mount slot connector. RefClk must, and does, pass through AC-coupling capacitors before entering the PEX 8114. Valid values for the AC-coupling capacitors are the same as for the *PCI Express Base Specification, Revision 1.0a* recommendation (75 to 200 nF, with package sizes of 0603 or 0402). The PEX 8114RDK-R uses 0.1 µF values, in 0402 packages.

RefClk to the PEX 8114 can be manually disabled by SW5, pin 6. RefClk to the PCI Express straddle-mount slot connector is enabled by the PEX 8114 HP_CLKEN# signal. The clock synthesizer frequency is determined by pull-up/pull-down resistors. Output enabling and Spread-Spectrum enabling are controlled by SW5, pins 8 and 7, respectively. (Refer to Section 3.4.2, "Switch SW5 – Strapping and RefClk Pin Control.") RefClk routing is laid out as a 100-Ohm, controlled-impedance, stripline-differential pair. Trace-length mismatch within this pair is less than 0.127 mm (0.005 inches).

3.5.2 PERST#

PERST# to the PCI Express straddle-mount slot connector (J5) is directly controlled by the PEX 8114 Hot Plug interface. PERST# to the PEX 8114 is controlled by the PEX 8114RDK-R Power Good indicator (DS10).

3.5.3 Lane Status LED Indicators

Four green surface-mount LEDs (DS6, DS7, DS8, and DS9) are attached to the four PEX 8114 PEX_LANE_GOOD[3:0]# balls, respectively, to indicate lane status. A lane is active when its LED is turned On.

3.5.4 Hot Plug

The PEX 8114 supports PCI Express Hot Plug. The PEX 8114RDK-R circuitry provides a pushbutton (SW1) for initiating a Hot Plug event, LED indicators for Attention (DS2) and Power (DS1), a switch to mimic a Manually operated Retention Latch, (HP_MRL#, SW5 – pin 5), and a power isolation circuit (U3) for the x16 PCI Express straddle-mount slot connector. The PEX 8114 Hot Plug Controller controls the PCI Express slot connector On/Off, which includes control of connector power, RefClk, and PERST# enable/disable sequencing.

3.6   PCI-X Interface

The PCI/PCI-X interface is a male board edge connector that complies with the *PCI-X Electrical and Mechanical Addendum to the PCI Local Bus Specification, Revision 2.0a*. The interface can operate in a PCI/PCI-X 64-bit slot, but only at +3.3V. The interface operates at up to PCI-X 133 MHz. The interface also provides the PEX 8114RDK-R with power, as well as +3.3 VDC to the PCI Express straddle-mount slot connector.

3.6.1   PCI RST#

PCI RST# into the PEX 8114 is generated by ANDing three signals:

- PEX 8114 Power Good signal from the Power Sequencer
- PCI RST# from the PCI/PCI-X board edge connector
- Manual PCI RST#, generated by the SW7 pushbutton

PCI RST# timing generated by the Power Good signal can be adjusted by way of the Power Sequencer.

3.7   Power

The PEX 8114RDK-R has three power domains:

- PEX 8114RDK-R board power for support circuitry
- PEX 8114 bridge device power
- PCI Express x16 straddle-mount slot connector power

3.7.1   Board Power

+3.3 VDC from the PCI/PCI-X board edge connector is used to generate voltages for the PEX 8114, and power the Power Sequencer IC (U12) used to turn On voltages to the PEX 8114. This voltage also powers circuitry that is not directly connected to the PEX 8114.

If voltages are applied to the PEX 8114 +3.3V VIO balls (*such as* PCI signals, Strapping balls, and so forth) without the PEX 8114 VDD33 balls being powered, the internal power ring begins to energize and a value of approximately +1.8V appears at the VDD33 balls. This is not known to cause a problem; however, the PEX 8114RDK-R ensures that this condition never occurs.

3.7.2   PEX 8114 Bridge Device Power

PEX 8114 power consists of:

- VDD_CORE   +1.0 ±0.1 VDC
- VTT   +1.3 to +1.8 VDC
- VIO   +3.3 ±0.3 VDC

3.7.2.1 PEX 8114 Voltage Generation

VDD10 and VDD10S are tied together and supplied by the VDD_CORE power plane. +3.3 VDC is provided to the PEX 8114RDK-R by way of the PCI/PCI-X board edge connector and passed to VIO. +3.3 VDC is also used to generate VDD_CORE and VTT. The PEX 8114 VTT voltage is jumper-selectable (JP7) and can be fixed at +1.5 VDC (jumper pins 1 and 2), or adjustable by way of a potentiometer (R69) (jumper pins 2 and 3).

The two PEX 8114 analog voltages, VDD33A and VDD10A, power internal core and SerDes PLLs. These voltages are delivered to the PEX 8114 from the VIO and VDD_CORE voltages, through LC filtering circuits.

3.7.2.2 PEX 8114 Voltage Sequencing

All three voltages (+3.3, VTT, and +1.0 VDC) can be sequentially turned On by the Power Sequencer IC (U12), which controls three MOSFET switches (Q3, Q5, and Q6). Optimal power sequence is from lowest to highest voltage. The Power Sequencer monitors under-voltage conditions, and turns Off PEX 8114 power when a fault is detected. Power-up sequencing is initiated by a one-shot Supervisor IC (U24) with a 150-ms timeout, powered by the +3.3 VDC from the PCI/PCI-X board edge connector. Power sequencing can also be manually initiated, using pushbutton SW8. Red LED DS4 indicates when the PEX 8114RDK-R is receiving +3.3 VDC; however, the sequencer is not enabled. This LED momentarily blinks On when the PEX 8114RDK-R is first powered up.

Alternatively, the Power Sequencer can be bypassed by removing the Q3, Q5, and Q6 MOSFET switches and installing fuses F3 (3.0A), F7 (3.0A), and F5 (0.5A), respectively. To date, this power-up method has been successfully implemented without experiencing problems. If current draw measurements are needed, F3, F7, and F5 can be populated with current-sense resistors instead.

3.7.3   PCI Express Power

The PEX 8114RDK-R, as per the *PCI Express Base Specification, Revision 1.0a*, must provide +3.3V and 12V power to the PCI Express female straddle-mount slot connector. An on-board Hot Plug power switch, controlled by the PEX 8114, turns the slot connector power On/Off. +3.3 VDC is provided by the PCI/PCI-X board edge connector. Power to the PCI Express slot connector for +12 VDC, up to 2.3A draw, can be from an on-board +5 to +12 VDC converter that draws from +5 VDC provided by the PCI/PCI-X board edge connector. For heavier loads, +12 VDC can be provided from an ATX supply, by way of a standard 4-pin hard-drive header.

Note: This voltage converter is not operable on current versions of the PEX 8114RDK-R. PCI Express +12 VDC must be obtained from the 4-pin hard-drive header.

4 Mechanical Architecture

4.1 Monitoring Point, LED Indicator, and Control Summary

This section summarizes the PEX 8114RDK-R interfaces that are used for monitoring, indicating, and controlling PEX 8114 performance.

4.1.1 Monitoring Points

Table 1. PEX 8114RDK-R Monitoring Points

Footprint/ Silkscreen Label	Function
C27, plus side	Monitors +3.3 VDC on the PCI Express straddle-mount slot connector, J5.
C28, plus side	Monitors +12 VDC on the PCI Express straddle-mount slot connector, J5.
F3	Test Point via at this footprint can be used to monitor VDD_CORE voltage to the PEX 8114.
F5	Test Point via at this footprint can be used to monitor VTT voltage to the PEX 8114.
F7	Test Point via at this footprint can be used to monitor VIO voltage to the PEX 8114.
L8	Test Point via at this footprint can be used to monitor VDD10A voltage to the PEX 8114.
L9	Test Point via at this footprint can be used to monitor VDD33A voltage to the PEX 8114.

4.1.2   LED Indicators

Table 2. PEX 8114RDK-R LED Indicators

Location/ Silkscreen Label	Color	Function
DS1	Green	Hot Plug HP_PWRLED# signal Hot Plug indicator for slot J5: ▪ **LED is turned On** – Slot J5 is powered On. ▪ **LED is turned On and blinking** – Slot J5 is in the process of being powered On or Off. ▪ **LED is turned Off** – Slot J5 is powered Off.
DS2	Amber	Hot Plug HP_ATNLED# signal Hot Plug indicator for slot J5: ▪ **LED is turned On** – Slot J5 has an operational problem. ▪ **LED is turned On and blinking** – A Hot Plug event for Slot J5 is occuring. ▪ **LED is turned Off** – Slot J5 is in standard operation.
DS3	Red	Turned On when pushbutton SW7 is pushed.
DS4	Red	Turned On when pushbutton SW8 is pushed. Turned On when the PEX 8114RDK-F is receiving +3.3 VDC, but the Power Sequencer is turned Off.
DS5	Green	Indicates that PEX 8114 power is On, and PERST# to the PEX 8114 is de-asserted.
DS9, DS8, DS7, DS6	Green	PEX_LANE_GOOD[3:0]# status indicators for Lanes 3, 2, 1, or 0, respectively. Turned On when the associated lane is active.
DS10	Green	Power Good indicator. Turned On when the PCI Express straddle-mount slot connector power is good.

4.1.3   Controls

Table 3. PEX 8114RDK-R Controls

Location/ Silkscreen Label	Function
SW1	Hot Plug Attention Button. Momentary SPST pushbutton control.
SW3	DIP switch control of PCIXCAP. (Refer to Section 3.4.1, "Switch SW3 – PCIXCAP Control.")
SW5	DIP switch control of some Strapping ball values to the PEX 8114, some PCI/PCI-X Bus speed control signals, and some RefClk generator control signals. (Refer to Section 3.4.2, "Switch SW5 – Strapping and RefClk Pin Control.")
SW7	Manual initiation of PCI Reset# to PEX 8114. Momentary SPST pushbutton control.
SW8	Manual initiation of PEX 8114 power-up sequence. Momentary SPST pushbutton control.
JP7, R69	PEX 8114 VTT voltage is jumper-selectable and can be fixed at +1.5 VDC (jumper JP7, pins 1 and 2), or adjustable by way of a potentiometer (jumper JP7, pins 2 and 3 and potentiometer R69).

4.2 Layout Information

4.2.1 Trace Routing Design Rules

The characteristic trace impedances are within the *PCI Express Base Specification, Revision 1.0a*-defined spec (100 Ohm ±5%) for differential, and within the *PCI Express to PCI/PCI-X Bridge Specification, Revision 1.0*-defined spec (57 Ohm ±5%) for the single-ended.

4.2.2 Power Decoupling

Power decoupling is provided by two means – plane capacitance (provided by the PCB stackup) and discrete decoupling capacitors. Plane capacitance filters noise above approximately 100 MHz. The footprints for the discrete decoupling capacitors are designed such that the inductance between the pad and plane is reduced by careful via placement. (Refer to Figure 6.)

1206 Package – Low Volt – 0.87 nH
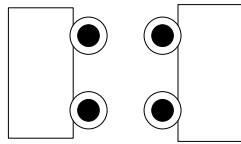
1206 Package – High Volt – 0.94 nH
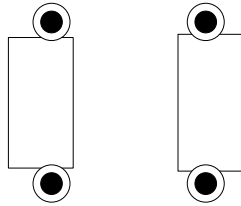
0603 Package – 4 Via – 0.58 nH
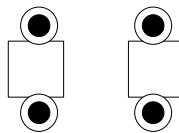
0603 Package – 2 Via – 0.78 nH
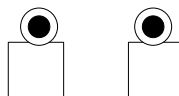
Figure 6. Decoupling Capacitor Footprints

4.2.3   PCB Layer Stackup

The PEX 8114RDK-R is a 12-layer, 63-mil thick PCB, as illustrated in Figure 7. The target signal impedance for all routing layers is 57 Ohm ±5% single-ended impedance and 100 Ohm ±5% differential.

This PCB stackup was chosen for the following reasons:

- Power/ground plane arrangement provides capacitance to filter supply voltage noise above 100 MHz

- Differential pair routing layers and plane layers arrangement provides shielding for the PCI Express signals
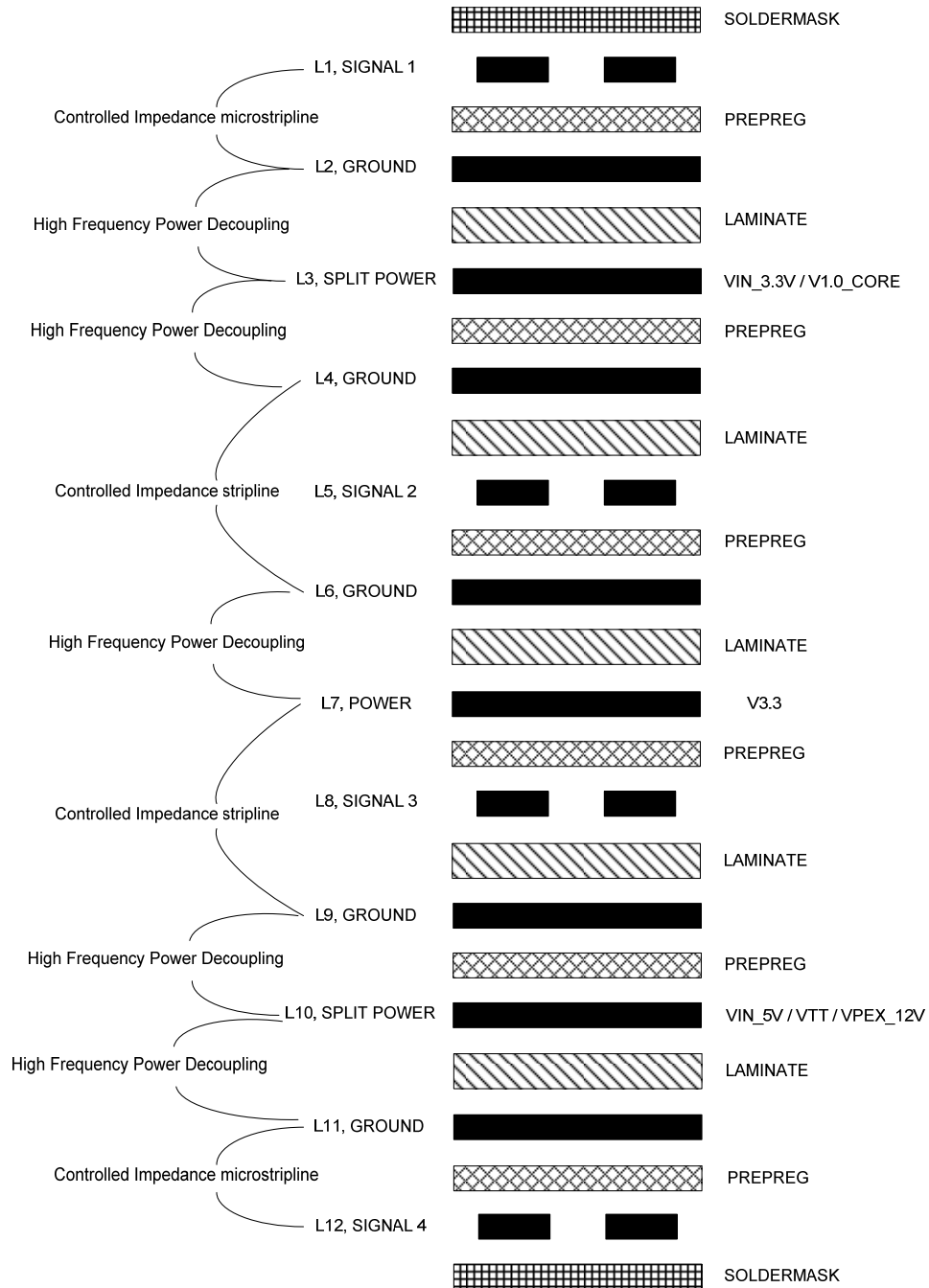
Figure 7. PEX 8114RDK-R 12-Layer PCB Stackup

5   References

The following is a list of documentation to provide further details.

- PLX Technology, Inc.
  870 W Maude Avenue, Sunnyvale, CA 94085 USA
  Tel: 800 759-3735 or 408 774-9060, Fax: 408 774-2169, http://www.plxtech.com

    - *PEX 8114BC/BD Data Book, Version 3.1* or higher

    - *PEX 8114BD Errata, Revision 1.0* or higher

    - *PEX 8114BB Design Checklist Application Note, Version 1.0* or higher

    - *PEX 8114RDK-F Hardware Reference Manual*

- PCI Special Interest Group (PCI-SIG)
  3855 SW 153rd Drive, Beaverton, OR 97006 USA
  Tel: 503 619-0569, Fax: 503 644-6708, http://www.pcisig.com

    - *PCI Local Bus Specification, Revision 2.3*

    - *PCI Local Bus Specification, Revision 3.0*

    - *PCI Express Card Electromechanical (CEM) Specification, Revision 1.1*

    - *PCI to PCI Bridge Architecture Specification, Revision 1.1*

    - *PCI Bus Power Management Interface Specification, Revision 1.2*

    - *PCI Express Base Specification, Revision 1.0a*

    - *PCI Express to PCI/PCI-X Bridge Specification, Revision 1.0*

    - *PCI-X Addendum to PCI Local Bus Specification, Revision 1.0b*

    - *PCI-X Addendum to PCI Local Bus Specification, Revision 2.0a*

    - *PCI-X Electrical and Mechanical Addendum to the PCI Local Bus Specification, Revision 2.0a*

6   Bill of Materials and Schematics

This section replicates the PEX 8114RDK-R Bill of Materials and schematics.

Item #	Qty	Mfgr	Mfgr Part #	Desc	Package Type	Component Designator(s)	Distributor	Dist Part #	Part
SURFACE MOUNT COMPONENTS									
1	17	Kemet	C0402C104K8PACTU	CAP .10UF 10V CERAMIC X5R 0402	SMT, 0402	C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C14, C18, C19, C20, C21, C25, C26	Digi-Key	399-3027-1-ND	0.1uF
2	22	Kemet	C0603C104K3RACTU	CAP .1UF 25V CERAMIC X7R 0603	SMT, 0603	C11, C13, C51, C52, C53, C54, C55, C56, C66, C67, C68, C82, C83, C84, C85, C100, C101, C102, C103, C116, C117, C175	Digi-Key	399-1281-1-ND	0.1uF
3	4	Kemet	C0603C103K5RACTU	CAP 10000PF 50V CERAMIC X7R 0603	SMT, 0603	C12, C15, C17, C129	Digi-Key	399-1091-1-ND	0.01uF
4	2	Panasonic	ECJ-3YB1C106M	CAP 10UF 16V CERAMIC X5R 1206	SMT, 1206	C22, C41	Digi-Key	PCC2227CT-ND	10uF
5	2	Kemet	C0603C220J5GACTU	CAP CERAMIC 22PF 50V NP0 0603	SMT, 0603	C23, C24	Digi-Key	399-1053-1-ND	22pF
6	2	Kemet	T491C226K020AS	CAPACITOR TANT 22UF 20V 10% SMD	EIA size C	C27, C28	Digi-Key		22uF
7	3	Panasonic	ECJ-1VB1A105K	CAP 1UF 10V CERAMIC 0603 X5R	SMT, 0603	C45, C181, C182	Digi-Key	PCC2174CT-ND	1uF
8	17	Panasonic	ECJ-3YB1C106M	CAP 10UF 16V CERAMIC X5R 1206 LOVOLT FOOT PRINT	SMT, 1206, LoVolt	C47, C48, C49, C50, C63, C64, C65, C78, C79, C80, C81, C96, C97, C98, C99, C114, C115	Digi-Key	PCC2227CT-ND	10uF
9	27	Kemet	C0603C102K5RACTU	CAP, SMD, CER, 1000PF, 50V, X7R, 0603, 2 VIA	SMT, 0603, 2 via	C57, C58, C59, C60, C61, C62, C74, C75, C76, C77, C91, C92, C93, C94, C95, C109, C110, C111, C112, C113, C122, C123, C124, C125, C130, C177, C179	Digi-Key	399-1082-1-ND	1000pF
10	19	Panasonic	ECJ-0EB1C223K	CAP, SMD, CER, 22000PF, 16V, 10%, X7R, 0402	SMT, 0402	C69, C70, C71, C72, C73, C86, C87, C88, C89, C90, C104, C105, C106, C107, C108, C118, C119, C120, C121	Digi-Key	PCC2138CT-ND	0.022uF
11	1	Panasonic	ECJ-1VB1H332K	CAP 3300PF 50V CERAMIC X7R 0603	SMT, 0603	C126	Digi-Key	PCC1778CT-ND	3300PF
12	2	Panasonic	ECJ-1VB1H222K	CAP 2200PF 50V CERAMIC X7R 0603	SMT, 0603	C127, C132	Digi-Key	PCC1776CT-ND	2200PF
13	2	Panasonic	ECJ-1VB1H152K	CAP 1500PF 50V CERAMIC X7R 0603	SMT, 0603	C128, C131	Digi-Key	PCC1774CT-ND	1500PF
14	2	Panasonic	ECJ-1VB1A224K	CAP .22UF 10V CERAMIC X5R 0603	SMT, 0603	C178, C180	Digi-Key	PCC1749CT-ND	0.22uF
15	7	Panasonic	LNJ308G8LRA	LED GREEN SS TYPE LOW CUR SMD	SMT, 0603	DS1, DS5, DS6, DS7, DS8, DS9, DS10	Digi-Key	P521CT-ND	Green

Item #	Qty	Mfgr	Mfgr Part #	Desc	Package Type	Component Designator(s)	Distributor	Dist Part #	Part
16	1	Panasonic	LNJ408K8ZRA	LED AMBER SS TYPE LOW CUR SMD	SMT, 0603	DS2	Digi-Key	P522CT-ND	Amber
17	2	Panasonic	LNJ208R8ARA	LED RED HI BRT SS TYPE LO CUR SM	SMT, 0603	DS3, DS4	Digi-Key	P524CT-ND	RED LED
18	1	Adex	CONN-PCIEXP-16X-SM	PCI_EXP_X16_STRADDLE_MNT_CONN		J5			PCI_EXP_X16_STRADDLE_MNT_CONN
19	2	MuRata	BLM21AG121SN1	Ferrite, 200mA, 120 ohm at 100 MHz, DCR=0.15ohm	SMT. 0805	L8, L9	Digi-Key	490-1038-1-ND	120
20	2	International Rectifier	IRF7470	MOSFET, N-CHAN, 10A, Rds=13 mohm	SO8	Q1, Q2	Digi-Key	IRF7470-ND	IRF7470
21	4	Fairchild	FDN371N	MOSFET, N-CHAN, 2.5A, Rds=60 mohm	SuperSOT-3	Q3, Q4, Q5, Q6			FDN371N
22	1	Panasonic	EXB-A10P332J	Chip Res. Array, 3.3K ohm, 5%, 8R bussed	745-CTS-RN-10	RN3	Digi-Key	U7332CT-ND	3.3K
23	16	Panasonic	ERJ-3GEYJ512V	RES 5.1K OHM 1/10W 5% 0603 SMD	SMT, 0603	R7, R8, R32, R46, R47, R66, R68, R104, R118, R122, R123, R125, R126, R127, R128, R129	Digi-Key	P5.1KGCT-ND	5.1K
24	18	Yageo	9C06031A0R00JLHFT	RES 0.0 OHM 1/10W 5% 0603 SMD	SMT, 0603	R10, R11, R63, R65, R113, R115, R116, R117, R119, R120, R121, R124, R131, R132, R133, R134, R135, R136	Digi-Key	311-0.0GCT-ND	0
25	3	Panasonic	ERJ-3GEYJ102V	RES 1.0K OHM 1/10W 5% 0603 SMD	SMT, 0603	R15, R16, R17	Digi-Key	P1.0KGCT-ND	1.0K
26	7	Panasonic	ERJ-3EKF33R2V	RES 33.2 OHM 1/16W 1% 0603 SMD	SMT, 0603	R18, R42, R43, R44, R45, R49, R50	Digi-Key	P33.2HCT-ND	33.2
27	1	Panasonic	ERJ-3GEYJ152V	RES 1.5K OHM 1/10W 5% 0603 SMD	SMT, 0603	R25	Digi-Key	P1.5KGCT-ND	1.5K
28	1	TT Electronics	LR2512-01-R040-F	RES 0.04 OHM 1.5W 1% 2512 SMD	SMT, 2512	R27	Mouser	66-LR2512-01-R040-F	0.04
29	3	Panasonic	ERJ-3EKF1002V	RES 10.0K OHM 1/16W 1% 0603 SMD	SMT, 0603	R28, R39, R108	Digi-Key	P10.0KHCT-ND	10.0K
30	1	TT Electronics	LR2512-01-R030-F	RES 0.03 OHM 1.5W 1% 2512 SMD	SMT, 2512	R31	Mouser	66-LR2512-01-R030-F	0.03
31	7	Panasonic	ERJ-3GEYJ151V	RES 150 OHM 1/10W 5% 0603 SMD	SMT, 0603	R33, R34, R35, R36, R37, R38, R48	Digi-Key	P150GCT-ND	150
32	1	Panasonic	ERJ-6RQJ4R7V	RES 4.7 OHM 1/8W 5% 0805 SMD	SMT, 0805	R41	Digi-Key	P4.7BCT-ND	4.7

Item #	Qty	Mfgr	Mfgr Part #	Desc	Package Type	Component Designator(s)	Distributor	Dist Part #	Part
33	6	Panasonic	ERJ-3EKF49R9V	RES 49.9 OHM 1/16W 1% 0603 SMD	SMT, 0603	R51, R52, R53, R54, R55, R57	Digi-Key	P49.9HCT-ND	49.9
34	7	Panasonic	ERJ-3GEYJ101V	RES 100 OHM 1/10W 5% 0603 SMD	SMT, 0603	R58, R59, R60, R61, R75, R76, R111	Digi-Key	P100GCT-ND	100
35	1	Bourns	3224W-1-503E	RES, VAR, 50 KOHM MULTI-TURN, 4mm SMD, TOP ADJ	BOURNS-3224W	R69	Arrow		50K
36	1	Panasonic	ERJ-3EKF4750V	RES 475 OHM 1/16W 1% 0603 SMD	SMT, 0603	R72	Digi-Key	P475HCT-ND	475
37	1	Panasonic	ERJ-3EKF9091V	RES 9.09K OHM 1/16W 1% 0603 SMD	SMT, 0603	R80	Digi-Key	P9.09KHCT-ND	9.09K
38	1	Panasonic	ERJ-3EKF1001V	RES 1.00K OHM 1/16W 1% 0603 SMD	SMT, 0603	R81	Digi-Key	P1.00KHCT-ND	1.00K
39	1	Panasonic	ERJ-3GEYJ391V	RES 390 OHM 1/10W 5% 0603 SMD	SMT, 0603	R84	Digi-Key	P390GCT-ND	390
40	1	Panasonic	ERJ-3EKF4992V	RES 49.9K OHM 1/16W 1% 0603 SMD	SMT, 0603	R88	Digi-Key	P49.9KHCT-ND	49.9K
41	1	Panasonic	ERJ-3EKF1242V	RES 12.4K OHM 1/16W 1% 0603 SMD	SMT, 0603	R89	Digi-Key	P12.4KHCT-ND	12.4K
42	2	Panasonic	ERJ-3EKF3161V	RES 3.16K OHM 1/16W 1% 0603 SMD	SMT, 0603	R90, R98	Digi-Key	P3.16KHCT-ND	3.16K
43	3	Panasonic	ERJ-3EKF7501V	RES 7.50K OHM 1/16W 1% 0603 SMD	SMT, 0603	R92, R95, R97	Digi-Key	P7.50KHCT-ND	7.50K
44	1	Panasonic	ERJ-3EKF2802V	RES 28.0K OHM 1/16W 1% 0603 SMD	SMT, 0603	R96	Digi-Key	P28.0KHCT-ND	28.0K
45	2	Panasonic	ERJ-3GEYJ200V	RES 20 OHM 1/10W 5% 0603 SMD	SMT, 0603	R102, R103	Digi-Key	P20GCT-ND	20
46	2	Panasonic	ERJ-3EKF3920V	RES 392 OHM 1/16W 1% 0603 SMD	SMT, 0603	R106, R112	Digi-Key	P392HCT-ND	392
47	1	Panasonic	ERJ-3GEYJ131V	RES 130 OHM 1/10W 5% 0603 SMD	SMT, 0603	R130	Digi-Key		130
48	1	Panasonic	ERJ-3GEYJ331V	RES 330 OHM 1/10W 5% 0603 SMD	SMT, 0603	R40	Digi-Key		330
49	3	Omron	B3S-1002	SWITCH TACT 6MM SMD MOM 230GF		SW1, SW7, SW8	Digi-Key	SW416-ND	SW PUSHBUTTON
50	1	PLX Technology	PEX8114-BD13BI	IC, PCI Express-PCIX bridge, Forward/Rev	pBGA256	U2			PEX8114

Item #	Qty	Mfgr	Mfgr Part #	Desc	Package Type	Component Designator(s)	Distributor	Dist Part #	Part
				erse, single x4 port, PCIX 133 MHz					
51	1	Intersil	ISL6161CB	IC, Hot Swap Controller, Dual, PCIEx	SOIC14	U3	Arrow		ISL6161
52	1	ICS	ICS9FG108G	IC, Frequency Timing Generator, current mode diff, 8 output, ssc capable, 100-400 MHz	TSSOP48	U4	NuHorizon		ICS9FG108G
53	1	Micrel	MIC49300BR	IC, V-REG, 3A, ADJ, SPak5	SPak5	U9	Arrow		MIC49300
54	1	Intersil	ISL6123IR	IC, Power Sequencer, 4 channel	QFN24	U12	Arrow		ISL6123
55	1	Maxim	MAX1806EUA15	IC, V-REG, 500 mA, ADJ 0.8-4.5V	SPAK5	U13			MAX1806
56	1	Fairchild	NC7SZ04M5X	IC, UHS INVERTER, 3-5 V	SOT23-5	U23	Digi-Key	NC7SZ04M5XCT-ND	NC7SZ04
57	1	Maxim	MAX6468	IC, One-shot, 150 msec	SC70-4	U24			MAX6468
58	1	Maxim	MAX6467	IC, One-shot, 150 msec	SC70-4	U25			MAX6467
59	1	Fairchild	NC7SZ08M5X	IC, AND GATE, 2-Input, Tpd=4.7 nsec max	SOT23-5	U42	Digi-Key	NC7SZ08M5XCT-ND	NC7SZ08M5X
THROUGH-HOLE COMPONENTS									
100	1	Amp	103308-1	CONN HEADER LOPRO STR 10POS 15AU	0.1" 2x5	JP1	Digi-Key		JTAG
101	1	3M	929400-01-36	HEADER, 1x3 VERTICAL, .1in THRU-HOLE	SIP-3	JP7	Digi-Key		JUMPER3
102	1	Grayhill	76SB02	SWITCH 2POS DIP EXT ROCK UNSEALD	SW DIP-2	SW3	Digi-Key		SW DIP-2
103	1	Grayhill	76SB08	SWITCH 8POS DIP EXT ROCK UNSEALD	SW DIP-8	SW5	Digi-Key		SW DIP-8
104	1	Citizen	HC49US25.000MABJ	Crystal, 25.00000MHz, fundamental, 18pF load capacitance, 50/100ppm		Y1	Digi-Key		25 MHz
105	1	Mill-Max	210-93-308-41-001000	Socket, DIP8, Thru-hole	DIP-8	U1	Digi-Key		EEPROM Socket
106	1	Molex	15-24-4049	Header, HD 4-pin		P2	Arrow		

Item #	Qty	Mfgr	Mfgr Part #	Desc	Package Type	Component Designator(s)	Distributor	Dist Part #	Part
MANUALLY INSERTED COMPONENTS									
200	1	Atmel	AT25640 A-10PI-2.7	IC SRL EE 64K 2.7V 8DIP	DIP-8	U1	Digi-Key		AT25640 A
201	1	Amp	881545-2	SHUNT LP W/HANDLE 2 POS 30AU		JP7	Digi-Key		
MISCELLANEOUS COMPONENTS									
300	1	PLX Technology	90-0051-100-A	PEX 8114 Reverse Bridge RDK PCB Rev 100					
301	1	Keystone	9203	Bracket, PCI, blank					
PARTS THAT SHOULD NOT BE ASSEMBLED									
400	2	Yageo	9C06031 A0R00JL HFT	RES 0.0 OHM 1/10W 5% 0603 SMD	SMT, 0603	R12, R64	Digi-Key	311-0.0GC T-ND	NL
401	2	Littelfuse	0433003. NR	FUSE, very fast acting,3.0A, 32V, 1206	SMT, 1206	F3, F7	Digi-Key	F1388 CT-ND	3.0A
402	1	Littelfuse	0433.500 NR	FUSE, very fast acting, 0.5A, 63V, 1206	SMT, 1206	F5	Digi-Key	F1377 CT-ND	0.5A
403	1	Maxim	MAX668E UB	IC, PWM Step-up controller	uMAX10	U18			MAX668E UB
404	1	TI	CDCVF25 05D	IC, PLL Clock Fanout 1:4, 24 to 200 MHz, skew < 150psec, 25 ohm on-chip series term	SOIC8	U17	Digi-Key	296-6723-5-ND	CDCVF25 05D
405	1	Coilcraft	MSS1260 -472MX	IND, 4.7uH, DCR=0.020 ohm, I=5.8A, 20%	MSS1260	L10			4.7uH
406	2	Central Semiconduc tor	CMHZ523 6B	Zener Diode, VZ=7.5V, 5%, SOD-123	SOD-123	D7, D8	Garrett Electronics		CMSH5-40
407	1	STMicroelec tronics	STS17NF 3LL	IC, MOSFET, Ids=17Amax , Ron=0.0055 ohm, SMD SO8	SO8	Q7	Digi-Key	497-3224-1-ND	STS17NF 3LL
408	4	AVX	TAJD686 K020R	CAP TANTALUM 68UF 20V 10% SMD	EIA size D, LoVolt	C38, C39, C40, C43	Digi-Key	478-1745-1-ND	68 uF
409	3	Panasonic	ECJ-4YB1C47 6M	CAP CERAMIC 47UF 16V X5R 1210	SMT, 1210	C29, C30, C31	Digi-Key	PCC23 35CT-ND	47uF
410	1	Panasonic	ERJ-M1WSJ8 M0U	RESISTOR .008 OHM 1W 5% 2512	SMT, 2512	R110	Digi-Key	P8.0T CT-ND	0.008
411	1	Panasonic	ERJ-3GEYJ20 4V	RES 200K OHM 1/10W 5% 0603 SMD	SMT, 0603	R107	Digi-Key	P200K GCT-ND	200K
412	1	Panasonic	ERJ-3EKF887 2V	RES 88.7K OHM 1/16W 1% 0603 SMD	SMT, 0603	R109	Digi-Key	P88.7K HCT-ND	88.7K

Item #	Qty	Mfgr	Mfgr Part #	Desc	Package Type	Component Designator(s)	Distributor	Dist Part #	Part
413	1	3M	929400-01-36	HEADER, 1x2 VERTICAL, .1in THRU-HOLE	SIP-2	JP2	Digi-Key		JUMPER
414	1	Kemet	C0603C330J5GACTU	CAP CERAMIC 33PF 50V NP0 0603	SMT, 0603	C32	Digi-Key		33pF
SECOND SOURCE / ALTERNATIVE PARTS									
500	2	Kemet	T491C226K020AS	CAPACITOR TANT 22UF 20V 10% SMD	EIA size C	C27, C28	Digi-Key		22uF
501	1	Grayhill	76SB02T	SWITCH DIP EXT ROCKER 2POS TH	SW DIP-2	SW3	Digi-Key		SW DIP-2
502	1	Fairchild	FDS6570A	IC, MOSFET, Ids=15Amax, Ron=0.0075 ohm, SMD SO8	SO8	Q7			FDS6570A
503	4	Fairchild	FDN339AN	MOSFET, N-CHAN, 3A, Rds=50 mohm	SuperSOT-3	Q3, Q4, Q5, Q6	Newark	34C0138	FDN339AN
PLX Part # 91-0051-100-D									
Product Name: PEX 8114RDK-R									

Table of Contents

NL = No Load

PCI Express Connector

HP_PERST#

Hot Plug Controller

X4 PCI Express

PEX_CLK

PB_CLK

REFCLK Generator

HD Header for bringing 12 VDC on-board for high current applications.

12 VDC

3.3 VDC

HP_CLKEN#

5 VDC to 12 VDC, 2.3 A, Voltage Converter

PEX 8114

EEPROM

JTAG Interface

Strapping switches

PERST#

3.3 VDC 1.5 VDC 1.0 VDC

PCI/PCI-X Bus 64 bit, up to 133 MHz

Power Up Sequencer

Voltage Regulators 3.3 to 1.5 3.3 to 1.0

5 VDC

3.3 VDC

PCI/PCI-X Connector
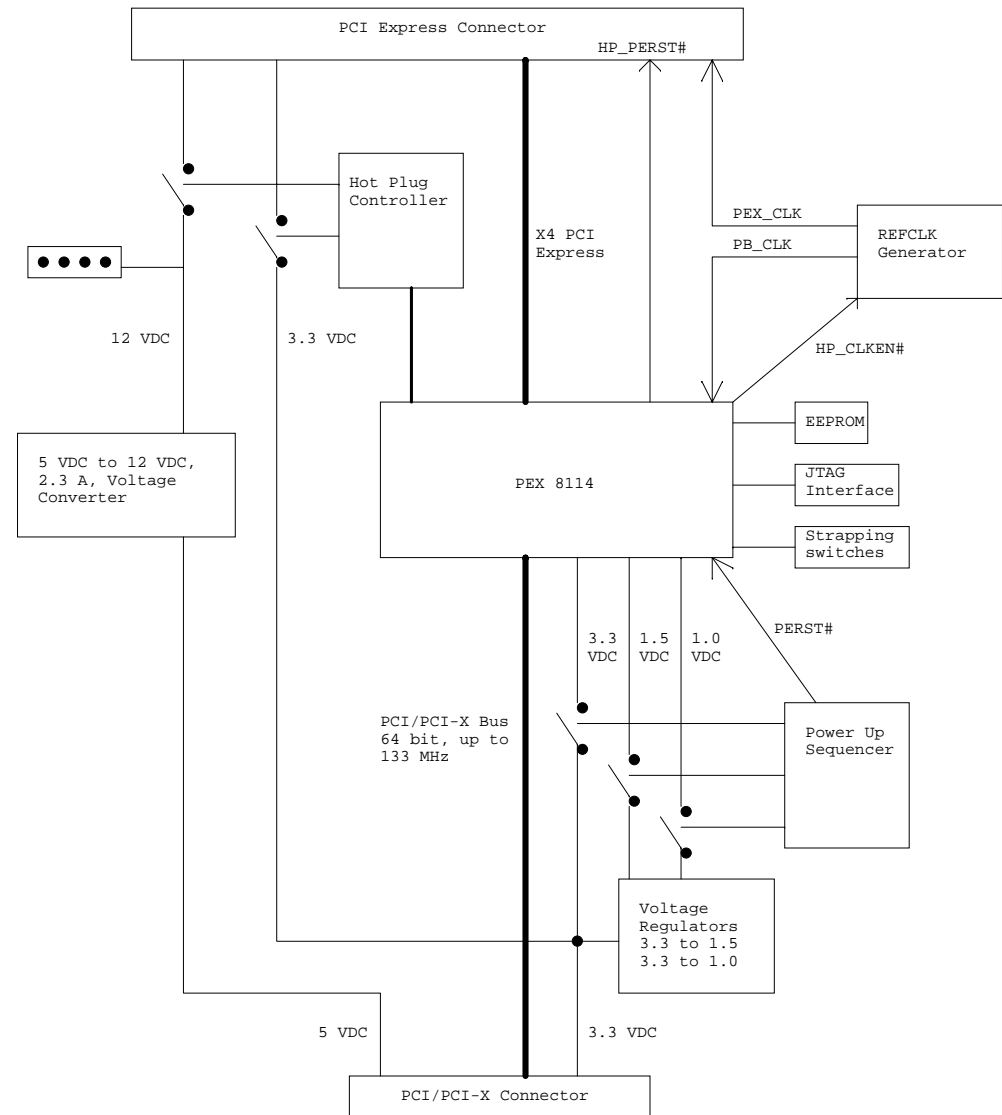
Revision History

Rev. #	Date	Reason for Revision
000	January 13, 2005	Distributed for Comprehensive Design Review
001	January 21, 2005	Results of Comprehensive Design Review
100	April 3, 2005	U23 power changed to V3.3 rail. REFCLK generator frequency controls made non-switchable. Switches changed. DS4 and DS3 silkscreen corrected.

PLX Technology, Inc.
870 Maude Avenue
Sunnyvale, CA 94085
www.plxtech.com

Title
PEX 8114 Reverse Bridge RDK - Functional Block Diagram

Size C	Document Number 91-0051-100-A	Rev 100
Date:	Tuesday, December 18, 2007	Sheet 1 of 9

Board
Thickness = 63 mils

LAYER STACKUP

		SOLDERMASK, Er=3.0, x.x mils
L1, SIGNAL 1		
		PREPREG, Er=4.0, x.x mils
L2, GND		
		LAMINATE, Er=4.0, 6.2 mils
L3, SPLIT POWER		VIN_3.3V/V1.0_CORE
		PREPREG, Er=4.0, x.x mils
L4, GND		
		LAMINATE, Er=4.0, 6.2 mils
L5, SIGNAL 2		
		PREPREG, Er=4.0, x.x mils
L6, GND		
		LAMINATE, Er=4.0, 6.2 mils
L7, POWER		V3.3
		PREPREG, Er=4.0, x.x mils
L8, SIGNAL 3		
		LAMINATE, Er=4.0, 6.2 mils
L9, GND		
		PREPREG, Er=4.0, x.x mils
L10, SPLIT POWER		VIN_5V/VTT/VPEX_12V
		LAMINATE, Er=4.0, 6.2 mils
L11, GND		
		PREPREG, Er=4.0, x.x mils
L12, SIGNAL 4		
		SOLDERMASK, Er=3.0, x.x mils

OUTER TRACES

WIDTH = 5.0 mils
Cu = 1.50 oz
Zo = 51.3 ohm

INNER TRACES

WIDTH = 4.0 mils
Cu = 0.50 oz
Zo = 50.6 ohm

4.200

5 VDC to 12 VDC Converter and Hot-Plug

REFCLK Gen

DIP Switches

HD Header

JTAG

EEPROM

REFCLK Control

Power Sequencer

PEX 8114 Voltage Reg.

PEX 8114

PCIXCAP

0.325

0.000

0.000

7.750

All dimensions in inches

PCI Express Hot-Plug

PCI/PCI-X 64-Bit
Bus Extension

Strapping Pins

EEPROM Interface

PCI/PCI-X
Control Signals

EEPROM

SERIAL EEPROM SOCKET

PCI/PCI-X 32-Bit
Bus

PCI Express x4 Port

PCI/PCI-X
Arbiter

JTAG Interface

PCI/PCI-X
Clocks

PCI/PCI-X
Interrupts

JTAG HEADER

PLX PEX8114BD-PBGA256

5 VOLT TO 12 VOLT REGULATOR

VIN_5V

C29 47uF
C30 47uF
C31 47uF
L? 4.7uH

C180 0.22uF

D7 CMSH5-40
D8 CMSH5-40

2.3 A

VPEX_12V

C38 68 uF
C39 68 uF
C40 68 uF
C43 68 uF

C182 1uF

Q7
S S S G   D D D D
FDS6570A

U18
VCC
SYNC/SHDNn   EXT
LDO   CS+
FREQ   FB
REF   PGND
GND
MAX668EUB

R111 100

R107 200K
C181 1uF
C178 0.22uF

C179 0.001uF
R110 0.008
C177 0.001uF
R108 10.0K 1%

R109 88.7K

PEX HOT PLUG CIRCUIT

JP2
JUMPER
2.5 Amp rated

P2
+5V GND GND +12V
IDE4_HEADER

Q1
G S S S
IRF7470
10A

VHP_12V

R27 0.04 1%

C11 0.1uF

C12 0.01uF
R103 20

U3_12VS
U3_12VG

C13 0.1uF

U3
12VS
12VG
VDD
NC
ENABLE#
3VG
3VS
ISL6161

12VISEN   14
RILIM   13
GND   12
CPUMP   11
CTIM   10
PGOOD   9
3VISEN   8

R28 10.0K 1%

0.1uF C14

HP_PWRFLT# {3,7}

VHP_3.3V

{3} HP_PWREN#

C15 0.01uF
R102 20

U3_3VG
U3_3VS

Q2
G S S S
IRF7470
10A

VIN_3.3V

R31 0.03 1%

REFCLK GENERATOR

V3.3	R41	
C18 C19 C20	4.7	C21 C22
0.1uF 0.1uF 0.1uF		0.1uF 10uF

Y1
25 MHz

C23 22pF
C24 22pF

U23 NC7SZ04
1 NC VCC 5
2 IN_A NOT_A 4
3 GND

{3} HP_CLKEN#
V3.3
HP_CLKEN

U4
1 XIN/CLKIN
2 X2
27 SEL14M_25M#
6 FS2
44 FS1
45 FS0
43 OE_0
37 OE_1
34 OE_2
28 OE_3
22 OE_4
16 OE_5
13 OE_6
7 OE_7
26 SPREAD
25 DIF_STOP#
24 SCLK
23 SDATA
46 IREF
ICS9FG108G

R133 0
R134 0
R135 0
R136 0

{7} REFCLK_ENABLE_PEX
{7} REFCLK_SPREAD
{7} REFCLK_STOP#
TPV11
TPV12

R72 475 1%

DIF_0 42
DIF_0# 41
DIF_1 39
DIF_1# 38
DIF_2 33
DIF_2# 32
DIF_3 30
DIF_3# 29
DIF_4 20
DIF_4# 21
DIF_5 17
DIF_5# 18
DIF_6 11
DIF_6# 12
DIF_7 8
DIF_7# 9
REFOUT 5

R43 33.2 1%
R42 33.2 1%
R45 33.2 1%
R44 33.2 1%
R49 33.2 1%
R50 33.2 1%
R75 100
R58 100
R60 100
R59 100
R61 100

R53 49.9 1%
R54 49.9 1%
R52 49.9 1%
R51 49.9 1%
R57 49.9 1%
R55 49.9 1%
R76 100

PEX_CLK {6}
nPEX_CLK {6}
TPV14
TPV13

C25 0.1uF
C26 0.1uF
PB_CLK {3}
nPB_CLK {3}

25_MHZ_CLK TPV10

Title
PEX 8114 Reverse Bridge RDK - Ref. Clock Generator

Size C
Document Number 91-0051-100-A
Rev 100

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PCI-X CARD EDGE CONNECTOR

PCI EXPRESS CARD SLOT CONNECTOR

KEYWAY

KEYWAY

PCIX_CONN_MALE

PCI_EXP_X16_STRADDLE_MNT_CONN

VIN_5V

VIN_3.3V

VHP_3.3V

VHP_12V

Title	PEX 8114 Reverse Bridge RDK - PEX and PCI Connectors	
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V3.3

R32
5.1K

SW1

HP_BUTTON# (3)

SW PUSHBUTTON

V3.3

R48
150

DS10

HP_PWRFLT# (3,4)

Green

PCI Express Slot
Power Good Indicator

V3.3

DS6   R33
             150

(3) LED_LANE_0

Green

V3.3

DS1   R36
             150

(3) HP_PWRLED#

Green

DS7   R34
             150

(3) LED_LANE_1

Green

DS2   R38
             150

(3) HP_ATNLED#

Amber

DS5   R40
             330

PB_PERST# (3,8)

Green

Board Power Good
Indicator

DS8   R35
             150

(3) LED_LANE_2

Green

DS9   R37
             150

(3) LED_LANE_3

Green

VIN_3.3V

R112
392

DS4
RED LED

VIN_3.3V

VIN_3.3V

R47
5.1K

SW8

MAN_POWR_CYCLE

SW PUSHBUTTON

U24

VCC

MR#   RST#

GND

MAX5468

POW_SEQ_ENABLE (8)

VIN_3.3V

R128   R106
5.1K   392

{8} PGOOD_PCI_RST#

DS3
RED LED

VIN_3.3V

VIN_3.3V

R46
5.1K

SW7

MAN_PCI_RST#

SW PUSHBUTTON

U25

VCC

MR#   RST#

GND

MAX5467

0   R11

NI   R12

U42

A   VCC
B
GND   Y

AND

NC7SZ08M5X

V3.3

(6) PCI_RST#

PB_PCIRESET# (3)

V3.3

RN3

10   1
9   2
8   3
7   4
6   5

3.3K

SW3

(3,6) PCI_PCIXCAP

SW DIP-2

C17
0.01uF

R39
10.0K
1%

SW5

1   16
2   15
3   14
4   13
5   12
6   11
7   10
8   9

SW DIP-8

EE_PR# (3)
M66EN (3,6)
PCI_SEL100 (3)
PLL_BYPASS# (3)
HP_MRL# (3)
REFCLK_ENABLE_PEX (5)
REFCLK_SPREAD (5)
REFCLK_STOP# (5)

PCI	SW1 = ON SW2 = X
PCI-X 66	SW1 = OFF SW2 = ON
PCI-X 100 or 133	SW1 = OFF SW2 = OFF

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Title
PEX 8114 Reverse Bridge RDK - SWITCHES/LEDS

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VIN_3.3V

V3.3

F7
3.0A

Q5
D S
G
FDN371N
V3P3_VIO_ON

BOARD POWER SEQUENCER

VTT_EARLY

VIN_3.3V   V1.0_CORE_EARLY

R96   R98   R90
28.0K   3.16K   3.16K
1%   1%   1%

R95   R97   R92
7.50K   7.50K   7.50K
1%   1%   1%

VIN_3.3V

V1.0_CORE_EARLY   V1.0_CORE

3.3V to 1.0V LINEAR REGULATOR

F3
3.0A

Q3
D S
G
FDN371N
V1P0_CORE_ON

U9
MIC49300
4 VIN   VOUT 5
2 VBIAS ADJ   1
GND
3

R81
1.00K

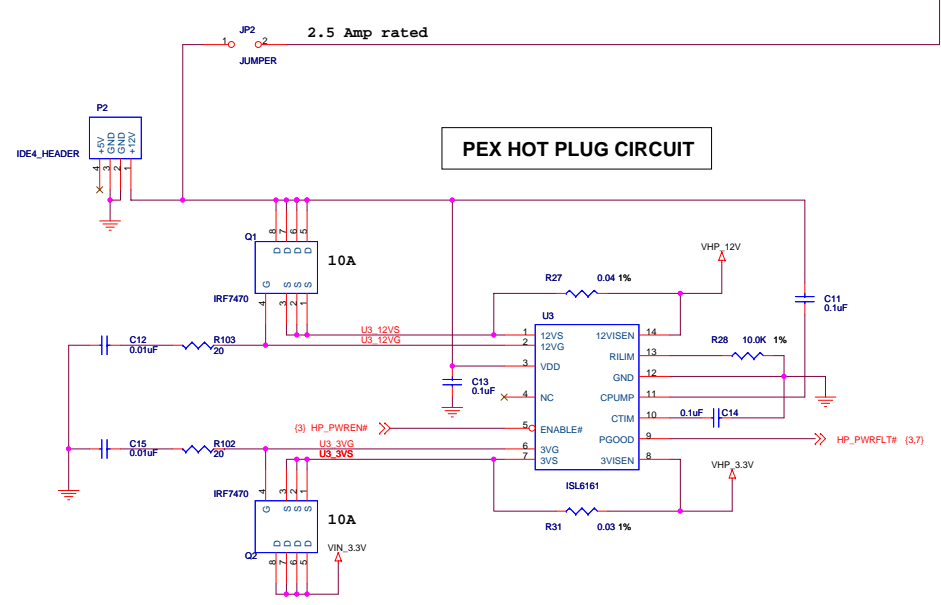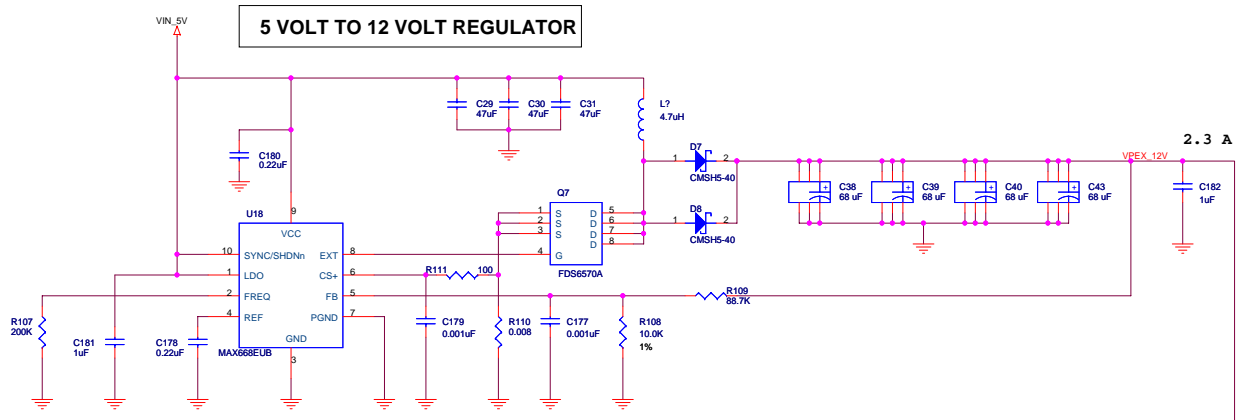R80
9.09K

VIN_3.3V

POW_SEQ_ENABLE   POW_SEQ_ENABLE
{7}

C175
0.1uF

U12

23 VDD   UVLO_A 20
                UVLO_B 12
1   ENABLE   UVLO_C 17
11 NC   UVLO_D 14

4.29 msec   C126 3300PF

2.86 msec   C127 2200PF   DON_VIO   21 DLY_ON_A   GATE_A 2   V3P3_VIO_ON
                           DON_VTT   8   DLY_ON_B   GATE_B 5   VTT_ON
1.95 msec   C128 1500PF   DON_CORE   16 DLY_ON_C   GATE_C 6   V1P0_CORE_ON
                           DON_PB_PERST# 15 DLY_ON_D   GATE_D 7   PERST#_OFF

VTT_EARLY   VTT

13 msec   C129 0.01uF   DOFF_VIO   18 DLY_OFF_A   SYSRST# 22
                           DOFF_VTT   13 DLY_OFF_B   5.1K   R129
F5   DOFF_CORE 3   DLY_OFF_C
0.5A   4   DLY_OFF_D   RESET#   24   PGOOD_PCI_RST# {7}
0.06 msec   NC   9
Q6   150 msec delay from
D S   PERST# deassert
G   1.30 msec   C130 0.001uF
FDN371N   0.06 msec   19 NC   THERM GND 10
VTT_ON

3.3V to 1.5V LINEAR REGULATOR

1.95 msec   C131 1500PF

ISL6123

C41
10uF

R69
50K

2.86 msec   C132 2200PF

PIN 25 IS A THERMAL PAD
UNDERNEATH U12.

U13
MAX1806
1 IN   OUT 8
2 IN   OUT 7
3 POK   SET 6
4 SHDN#
GND
5

R84
390

R89
12.4K

C45
1uF

JP7
JUMPER3

R88
49.9K
1%

VTT can be adjustable
from 1.0 to 1.8 volts,
or set to 1.5 volts,
by the jumper.

VIN_3.3V

Q4   FDN371N
D S
G

PB_PERST# {3,7}

R130
130

125 msec
delay from
PB_REFCLK
starting up

Title
PEX 8114 Reverse Bridge RDK - Power

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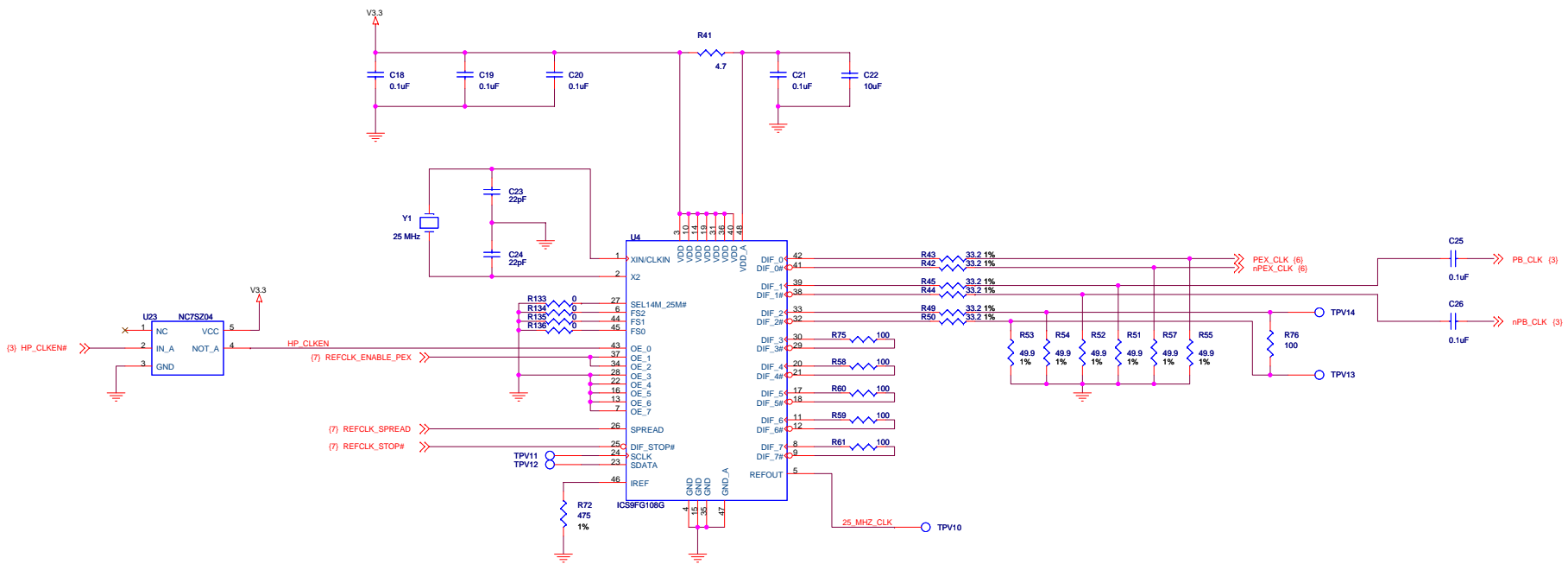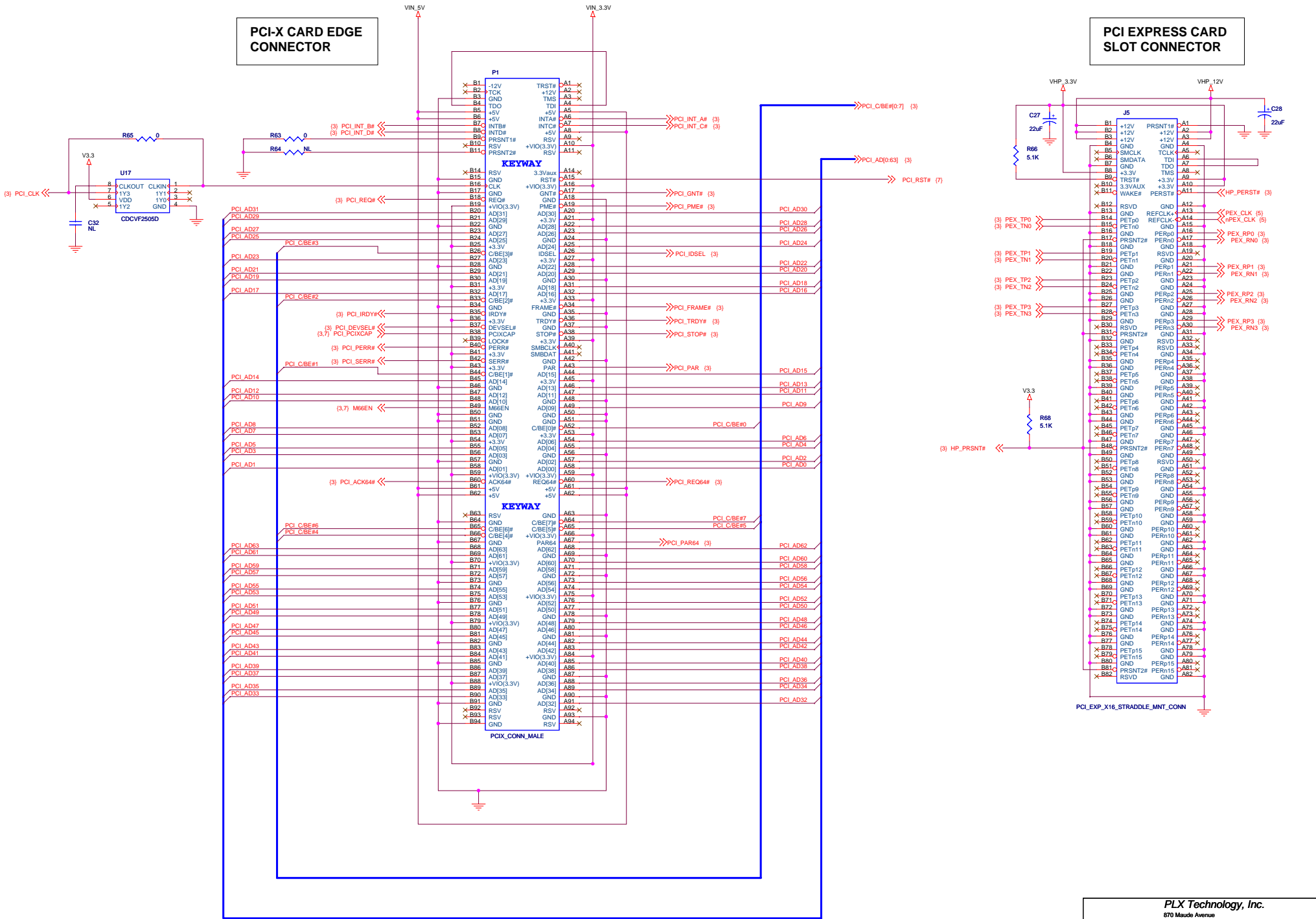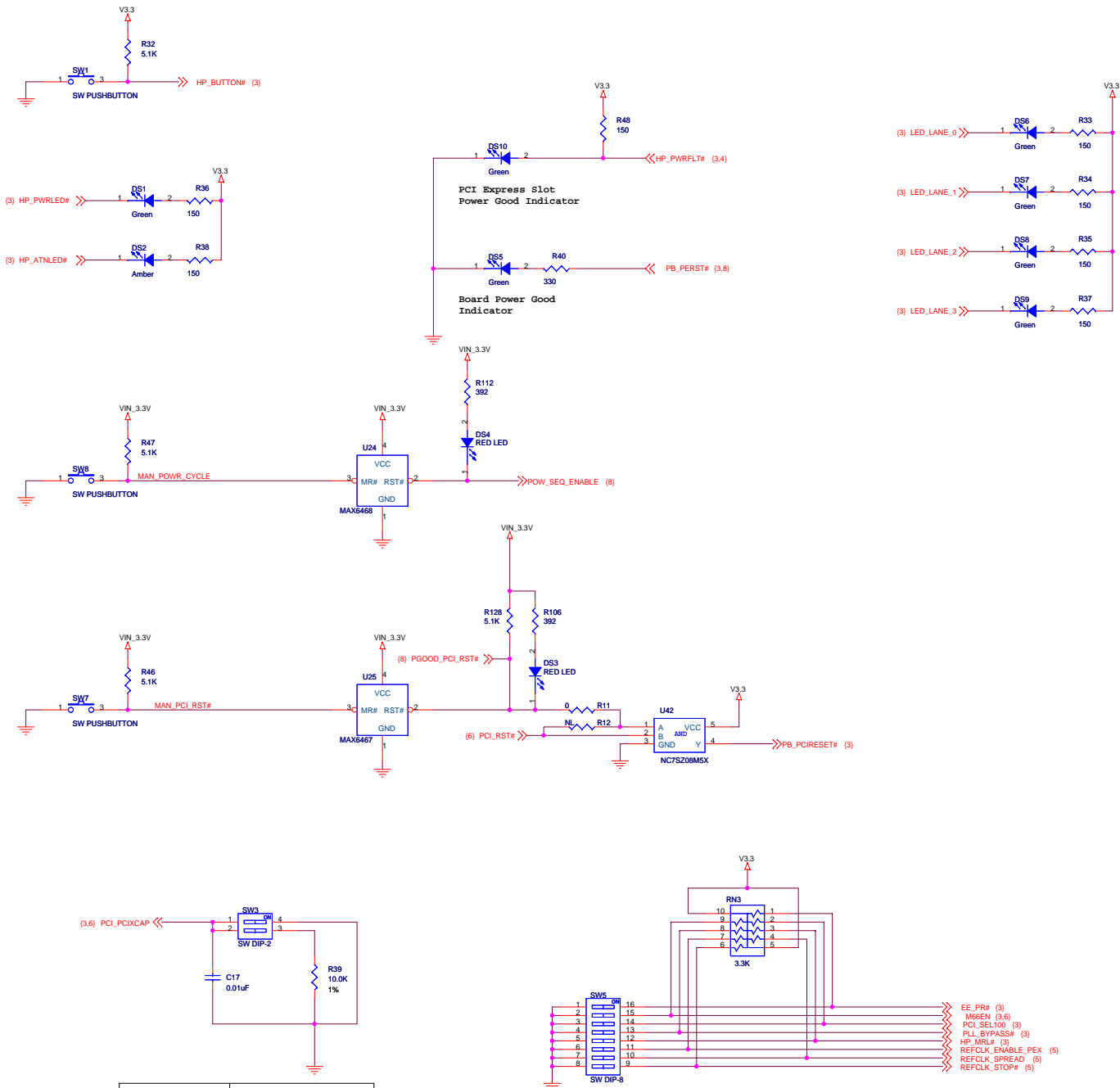
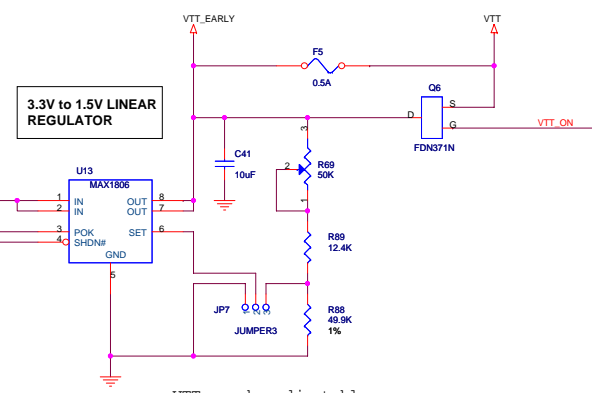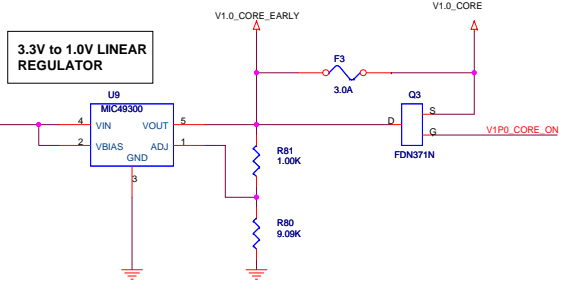Date: Tuesday, December 18, 2007   Sheet 8 of 9

CAP FOOTPRINTS

1206_LoVolt

1206_HiVolt

0603_4VIA

0603_2VIA

VIN_3.3V

C47 10uF | C48 10uF | C49 10uF | C50 10uF | C51 0.1uF | C52 0.1uF | C53 0.1uF | C54 0.1uF | C55 0.1uF | C56 0.1uF | C57 1000pF | C58 1000pF | C59 1000pF | C60 1000pF | C61 1000pF | C62 1000pF

1206_LoVolt   0603_2VIA   0603_2VIA

V1.0_CORE

C78 10uF | C79 10uF | C80 10uF | C81 10uF | C82 0.1uF | C83 0.1uF | C84 0.1uF | C85 0.1uF | C86 0.022uF | C87 0.022uF | C88 0.022uF | C89 0.022uF | C90 0.022uF | C91 1000pF | C92 1000pF | C93 1000pF | C94 1000pF | C95 1000pF

1206_LoVolt   0603_2VIA   0402   0603_2VIA

C63 10uF | C64 10uF | C65 10uF | C66 0.1uF | C67 0.1uF | C68 0.1uF | C69 0.022uF | C70 0.022uF | C71 0.022uF | C72 0.022uF | C73 0.022uF | C74 1000pF | C75 1000pF | C76 1000pF | C77 1000pF

1206_LoVolt   0603_2VIA   0402   0603_2VIA

V3.3

C96 10uF | C97 10uF | C98 10uF | C99 10uF | C100 0.1uF | C101 0.1uF | C102 0.1uF | C103 0.1uF | C104 0.022uF | C105 0.022uF | C106 0.022uF | C107 0.022uF | C108 0.022uF | C109 1000pF | C110 1000pF | C111 1000pF | C112 1000pF | C113 1000pF

1206_LoVolt   0603_2VIA   0402   0603_2VIA

VTT

C114 10uF | C115 10uF | C116 0.1uF | C117 0.1uF | C118 0.022uF | C119 0.022uF | C120 0.022uF | C121 0.022uF | C122 1000pF | C123 1000pF | C124 1000pF | C125 1000pF
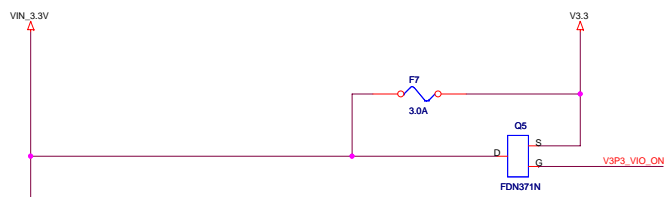
1206_LoVolt   0603_2VIA   0402   0603_2VIA

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Title: PEX 8114 Reverse Bridge RDK - Power Decoupling

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