ExpressLane PEX 8696-16U8D BB RDK
Hardware Reference Manual

Version 1.2

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Preface

Notice

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About This Manual

This Hardware Reference Manual describes the PLX PEX 8696 Rapid Development Kit (PEX 8696 RDK), from a hardware perspective. It contains a description of all major functional circuit blocks on the PEX 8696 RDK base board, and serves as a reference for creating software for this product. This manual also includes a complete Bill of Materials and Schematics.

Revision History

Date	Version	Comments
October 2009	0.5	Initial Release
December 2009	1.0	Made corrections to Table 2. Other miscellaneous etis.
February 2010	1.1	Updated Schematic
March 2010	1.2	Updated BOM

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1 General Information

The PLX PEX 8696 RDK is a Rapid Development Kit based upon PLX Technology's ExpressLane™ PEX 8696, a 96-Lane, 24-Port, 6-Station PCI Express Gen 2 switch. The PEX 8696 RDK provides a complete hardware and software development platform to facilitate getting designs up and running quickly, lowering risk and reducing time-to-market. The PEX 8696 RDK consists of a base board containing seven hardware configuration modules, a cable adapter board that plugs into the Host system, four mini-SAS cables and a SATA cable (used to connect the adapter board to the base board), and a Software Development Kit (SDK). The SDK is downloadable from the PLX web site, at www.plxtech.com/products/sdk.

This manual primarily focuses on the PEX 8696 RDK board, and its use with other parts provided as part of the RDK. Figure 1 provides a component-side view of the PEX 8696 RDK board.

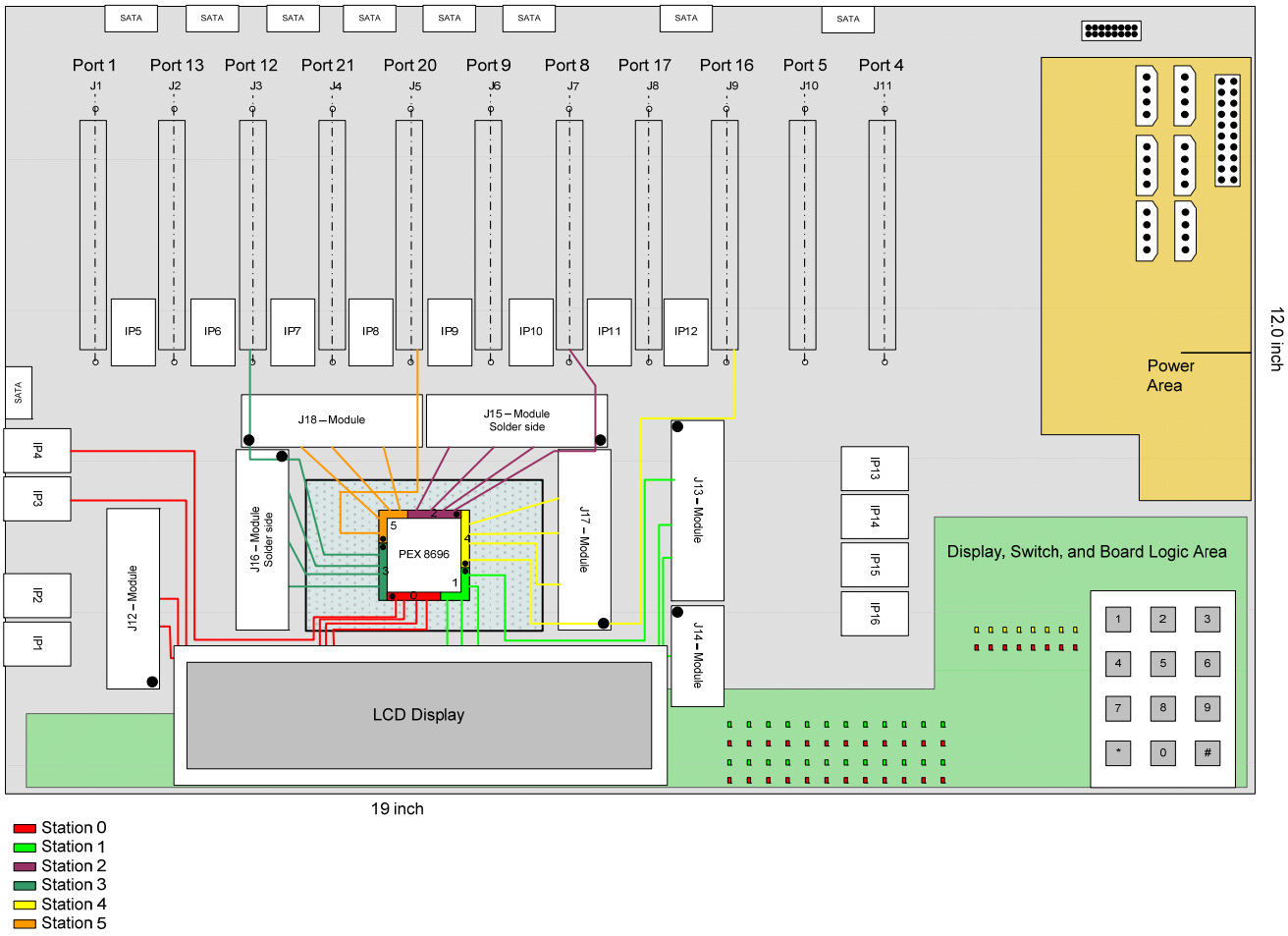


Figure 1. PEX 8696 RDK Board Component Layout

1.1 PEX 8696 Switch Features

- 96-Lane, 24-Port, Multi-host (multi-root) PCI Express Gen 2 switch
- High-Performance 1,156-ball Flip Chip BGA (HFCBGA) package (35 x 35 mm^2) with Heat Spreader
- 960 GT/s aggregate bandwidth (5.0 GT/s/Lane x 96 SerDes Lanes x 2 (full duplex))
- Non-blocking Crossbar Switch interface supports TLP bandwidth capacity of each x16 Link
- Out-of-band communication/initialization interfaces (serial EEPROM and I^2C)
- 2,048-byte Maximum Payload Size
- Performance tuning
- Choice of width (number of Lanes) per unique Link/Port – x4, x8, or x16
- Allows any Port to be designated as the upstream Port (Port 0 is recommended)
- Configuration with Strapping balls, serial EEPROM, or I^2C
- Lane reversal
- Polarity reversal
- Quality of Service (QoS) with one Virtual Channel (VC0) and eight Traffic Classes (TC[7:0])
- Non-Transparent Bridging (NTB)
- Read Pacing (intelligent bandwidth allocation)
- Multicast
- INTA# (PEX_INTA#) and FATAL ERROR (FATAL_ERR#) (Conventional PCI SERR# equivalent) ball support
- Compliant to the following specifications:
  - *PCI Local Bus Specification, Revision 3.0*
  - *PCI Bus Power Management Interface Specification, Revision 1.2*
  - *PCI to PCI Bridge Architecture Specification, Revision 1.2*
  - *PCI Express Base Specification, Revision 2.0*
  - *PCI Express Card Electromechanical Specification, Revision 2.0*
  - *The I^2C-Bus Specification, Version 2.1*

1.2 PEX 8696 RDK Board Features

- PLX PEX 8696 PCI Express Gen 2 switch in a 1,156-ball HFCBGA package.
- 11 downstream PCI Express slot connectors. Hardware configuration is determined by plug-in Configuration modules.
- DIP switches, for hardware configuration of the PEX 8696 switch.
- Transparent or Non-Transparent (NT) switch support.
- Two Hot Plug-controllable slots – one through a Parallel Hot Plug Controller interface, and one through the Serial Hot Plug Controller interface.
- Socketable serial EEPROM.
- I^2C interface, to read and write registers.
- Manual pushbutton PERST#.
- LCD display and LED indicators to show Port configuration and status.
- Four dedicated power rails provide power to the PEX 8696, and only the PEX 8696. On-board supplies or external supplies can be used.
- 12-layer board, 82 mil thick.

2 System Architecture

The PEX 8696 RDK is a PLX Rapid Development Kit primarily intended for use by PLX customers for silicon evaluation and design reference for PEX 8696 switches in the 35 x 35 mm^2 package. The PEX 8696 RDK consists of three main hardware components:

- Base board, which is meant to lay on a bench top and houses the PEX 8696 switch
- PCI Express slot-to-cable adapter board, which is meant to plug into a PC platform for the upstream Port connection
- Cable assembly, which connects the base board to the adapter board

Figure 2 provides a diagram of the PEX 8696 RDK, being used in a PC. Figure 3 represents the placement of major component blocks on the PEX 8696 RDK base board.

The PEX 8696 RDK base board is similar to a motherboard in form factor. The base board is meant to lay on a benchtop, and provides 11 PCI Express slots for add-in boards. Brackets are included, to provide mechanical support to add-in boards. Board power is supplied by an external ATX supply (P10). The PEX 8696 RDK base board supports up to 12 Ports (one upstream and 11 downstream). By default, the upstream Port is Port 0 and the NT Port is Port 4. All available Port width combinations are possible with the PEX 8696 RDK, by means of *Configuration modules* that enable versatile routing of the Lanes from the PEX 8696 switch to the PCI Express connectors. Controls are provided, to support Hot Plug capability for Port 5 (Parallel Hot Plug) and Port 8 (Serial Hot Plug). On-board LED indicators display various configuration and status information. The power distribution system for the PEX 8696 RDK is such that accurate current draw measurements can be made, as well as supplying various PEX 8696 RDK base board supply voltages from an external source, for the purposes of voltage margining.

Note: *PLX recommends an override of the Signal Detect Level for 8696 lanes in the RDK that traverse cables. This allows for the signal path losses of these long links. The EEPROMs shipped have these adjustments for port 0, which is the upstream connection to the host.*

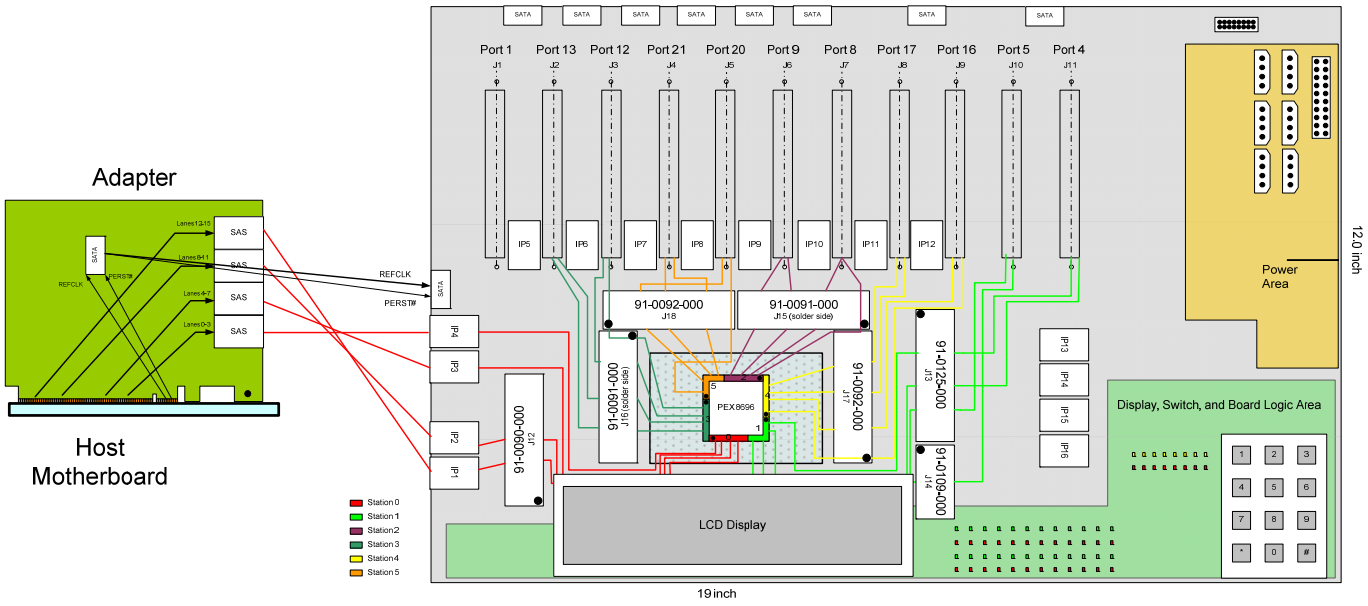


Figure 2: PEX 8696 RDK Being Used in a PC

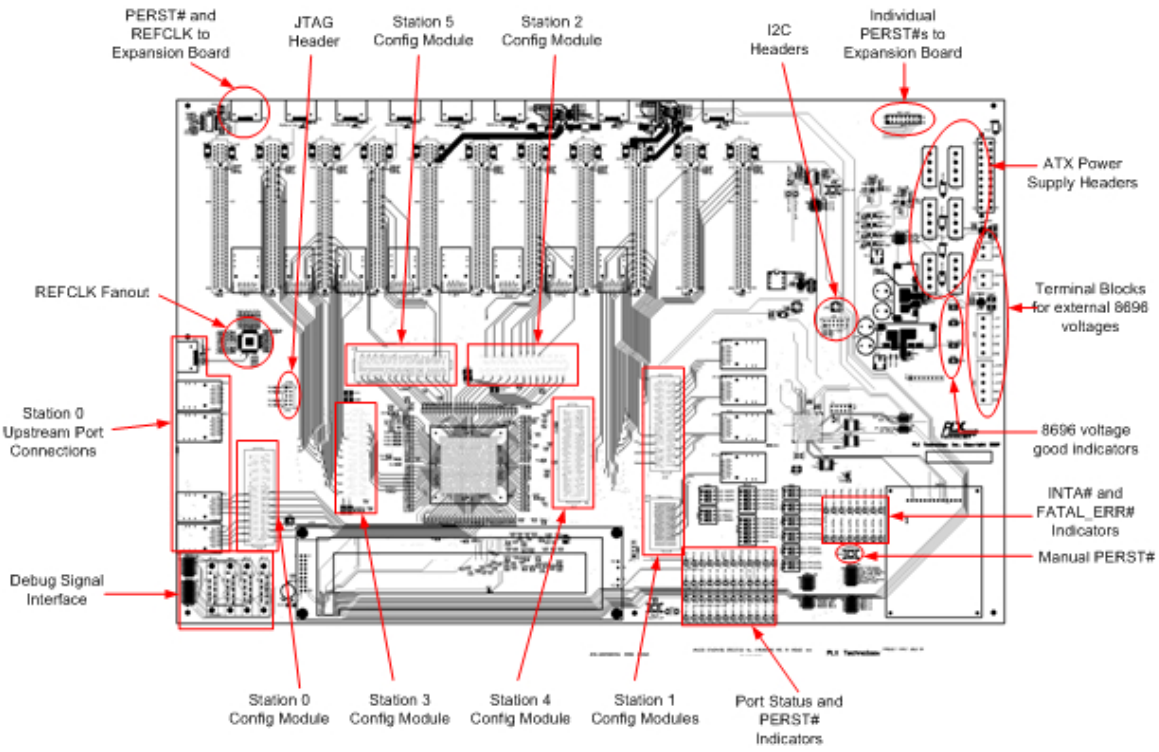


Figure 3: PEX 8696 RDK Board Component Layout

3 Hardware Architecture

3.1 PCI Express Port Configuration

The PEX 8696 is a 96-Lane, 24-Port, 6-Station non-blocking PCI Express Gen 2 switch that supports Transparent and NT modes of operation. This device can also support up to 8 virtual switches (Virtual Switch mode). The footprint for the PEX 8696 switch is laid out so that a heat sink can be attached to the switch, or a high-speed BGA test socket can be loaded onto the PEX 8696 RDK board.

The PEX 8696 RDK board fixes the upstream Port at Port 0 and the NT Port at Port 4, by default. The upstream Port connects to the Host through four mini-SAS cables that carry four Lanes each, and a serial ATA cable that provides RefClk and PERST#. On the Host side, the mini-SAS cables pass through the PC's bulkhead and attach to a cable adapter board, which plugs into one of the PC's PCI Express slots, allowing the computer lid to be closed.

The 8696 RDK board is capable of supporting up to 12 ports of x8 each. Seven Configuration modules are used to provide the routing flexibility to support all possible Port configurations. For instances in which the user requires more Ports, an Expansion board can be purchased separately which supports the other 12 Ports.

3.2 Configuration Modules

Seven Configuration modules are used to provide the routing flexibility to support all possible Port configurations. Six of the Configuration modules consist of a 10 x 40 ball board-to-board, high-speed connector, with one-half of the connectors mounted on the PEX 8696 RDK base board, and its mate mounted on a small 2-layer PCB that performs the re-mapping. There are no other components. Each module has a 4-pin interface which communicates its function to the CPLD glue logic. The seventh Configuration module is similar, but is a 10 x 20 ball array, and has a 3-pin interface to communicate function. The default configuration of the PEX 8696 RDK provides one -0090 configuration module, one -0125 configuration module, one -0109 configuration module, two -0091 configuration modules, and two -0092 configuration modules. Additional modules can be purchased separately.

Table 1. PEX 8696 RDK Board Port Configurations

	Port Configuration	Config Module (CM)	CM Connector	Lanes Routed to Connector			
				0 - 3	4 - 7	8 - 11	12 - 15
Station 0	x16	CM-090	J12	IP4	IP3	IP2	IP1
	x8, x8	CM-093				J1	
	x8, x4, x4	CM-091				J1	IP1
	x4, x4, x4, x4	CM-091					
Station 1	x16	CM-090, CM-108	J13, J14	J11			
	x16 (Cable)	CM-093, CM-107		IP13	IP14	IP15	IP16
	x8, x8	CM-125, CM-109		J11		J10	
	x8 (Cable), x8	CM-124, CM-109		IP13	IP14	J10	
	x8, x4, x4	CM-125, CM-107		J11		J10	IP16
	x4, x4, x4, x4	CM-091, CM-107		J11	IP14	J10	IP16
Station 2	x16	CM-090	J15	J7			
	x8, x8	CM-091		J7		J6	
	x8, x4, x4	CM-092		J7		J6	IP9
	x4, x4, x4, x4	CM-093		J7	IP10	J6	IP9
Station 3	x16	CM-090	J16	J3			
	x8, x8	CM-091		J3		J2	
	x8, x4, x4	CM-092		J3		J2	IP5
	x4, x4, x4, x4	CM-093		J3	IP6	J2	IP5
Station 4	x16	CM-090	J17	J9			
	x8, x8	CM-092		J9		J8	
	x8, x4, x4	CM-091		J9		J8	IP11
	x4, x4, x4, x4	CM-124		J9	IP12	J8	IP11
Station 5	x16	CM-090	J18	J5			
	x8, x8	CM-092		J5		J4	
	x8, x4, x4	CM-091		J5		J4	IP7
	x4, x4, x4, x4	CM-124		J5	IP8	J4	IP7

Default Configuration

External Cable Configuration

3.3 Hardware Strapping Balls

The PEX 8696 switch has several Strapping balls that provide the capability to perform various types of hardware initialization, without the use of software. These Strapping balls are brought out to DIP switches on the PEX 8696 RDK board. Table 2 defines each DIP switch and its default settings. Figure 6 shows the default board settings.

Table 2: PEX 8696 RDK Board Hardware Strapping DIP Switches

DIP Switch	Switch	Switch Strap Signal	Description	Default Setting
SW10	1 - 2	STN0_PORTCFG[1:0]	Determines the PEX 8696 - Station 0 Port configuration. LL = x4x4x4x4. LH = x16. HL = x8x8. HH = x8x4x4. Default is x16	01b
SW9	1 - 2	STN1_PORTCFG[1:0]	Determines the PEX 8696 - Station 1 Port configuration. LL = x4x4x4x4. LH = x16. HL = x8x8. HH = x8x4x4. Default is x8x8	10b
SW7	1 - 2	STN2_PORTCFG[1:0]	Determines the PEX 8696 - Station 2 Port configuration. LL = x4x4x4x4. LH = x16. HL = x8x8. HH = x8x4x4. Default is x8x8	10b
SW6	1 - 2	STN3_PORTCFG[1:0]	Determines the PEX 8696 - Station 3 Port configuration. LL = x4x4x4x4. LH = x16. HL = x8x8. HH = x8x4x4. Default is x8x8	10b
SW3	1 - 2	STN4_PORTCFG[1:0]	Determines the PEX 8696 - Station 4 Port configuration. LL = x4x4x4x4. LH = x16. HL = x8x8. HH = x8x4x4. Default is x8x8	10b
SW2	1 - 2	STN5_PORTCFG[1:0]	Determines the PEX 8696 - Station 5 Port configuration. LL = x4x4x4x4. LH = x16. HL = x8x8. HH = x8x4x4. Default is x8x8	10b
SW12	1 - 5	UP-PORTSEL[4:0]	Determines which Port is the upstream Port	00000b (Port)
SW14	1 - 5	NT-PORTSEL[4:0]	Determines which Port is the upstream NT Port	00100b (Port4)
	6	NT-ENABLE#	Enables (Low) or disables (High) NT mode.	1
SW5	1 - 3	I2C-ADDR[2:0]	In combination with the I2C/SMBus Configuration register *Slave Address* field (offset 294h, bits 6:3) determines the PEX 8696 switch's I2C Slave address.	000b
SW8	1 - 3	VS-MODE[2:0]	Determines how many Virtual Switches are implemented.	000b
SW1	1	SPARE8	This switch is not loaded. It exists to provide access to balls SPARE[8:3] for possible future use. These balls are currently not used.	N/A
	2	SPARE7		
	3	SPARE6		
	4	SPARE5		

DIP Switch	Switch	Switch Strap Signal	Description	Default Setting
	5	SPARE4		
	6	SPARE3		
SW4	1 - 5	TESTMODE[4:0]	***Factory Test Only***	01101b
	6	***Not used***		***Don't Care***
SW11	1	SERDES-MODE-EN#	Selects SERDES_MODE function, to aid with ***in-factory testing.***	0
	2	PROBE-MODE#	Selects PROBE_MODE function, to aid with ***in-factory testing.***	0
	3 - 4	DEBUG-SEL[1:0]	***Factory Test Only***	00b
SW13	1	NT-P2P-ENABLE#	Enables NT PCI-to-PCI bridge mode. Supported in Base mode (Mode-1) only. When Disabled, provides software compatibility to earlier NT mode switches.	1
	2	PLL-BYPASS#	Selects PLL_BYPASS function, to aid with ***in-factory testing.***	1
	3	FAST-BRINGUP#	Selects FAST-BRINGUP function, to aid with ***in-factory testing.***	1
	4	I2C_CFG_EN#	Enables I2C Bus for device configuration. When Disabled, Links start training after PERST# deasserted and EEPROM initialization.	1
	5	RSVD-17#	***Factory Test Only***	1
	6	G1-COMPATIBLE#	When Enabled, only Gen 1 data rate is advertised.	1
	7	SMBUS-EN#	Low Enables SMBus protocol on the I2C0 balls. High Enables I2C protocol on this interface.	1
	8	***Not used***		***Don't Care***
SW16	1	SHP-ENABLE#	Enables Hot Plug capability to Slot 5, using the Serial Hot Plug interface.	1
	2	SHP-MRL#	Simulates the MRL# signal for Serial Hot Plug capability to slot 5	0
SW17	1	HP-ENABLE#	Enables Hot Plug capability to Slot 9, using Parallel Hot Plug interface A.	1
	2	HP-MRL#	Simulates the MRL# signal for Parallel Hot Plug capability to slot 9	0
SW22	1	2.5V-ON	Enables the on-board 2.5 VDC voltage generator to the PEX 8696 switch.	1
	2	2.5VA-ON	Enables the on-board 2.5 Analog VDC voltage generator to the PEX 8696 switch.	1
	3	1.0V-ON	Enables the on-board 1.0 VDC voltage generator to the PEX 8696 switch.	1
	4	1.0VA-ON	Enables the on-board 1.0 Analog VDC voltage generator to the PEX 8696 switch.	1
SW20	1 - 4	SHP-SLOT[0:3]	Determines which Port has Serial Hot Plug	1111b

DIP Switch	Switch	Switch Strap Signal	Description	Default Setting
			control.	
SW23	1 - 8	PROBE/SERDES-MODE-INPUTS	Switch control of PROBE and SERDES Debug Mode Inputs, to aid with ***in-factory testing***	11111111b
SW24	1 - 10	PROBE/SERDES-MODE-INPUTS	Switch control of PROBE and SERDES Debug Mode Inputs, to aid with ***in-factory testing***	1111111111b

3.4 Default Configuration (Station0, x16 UP, all other stations x8x8 DOWN)

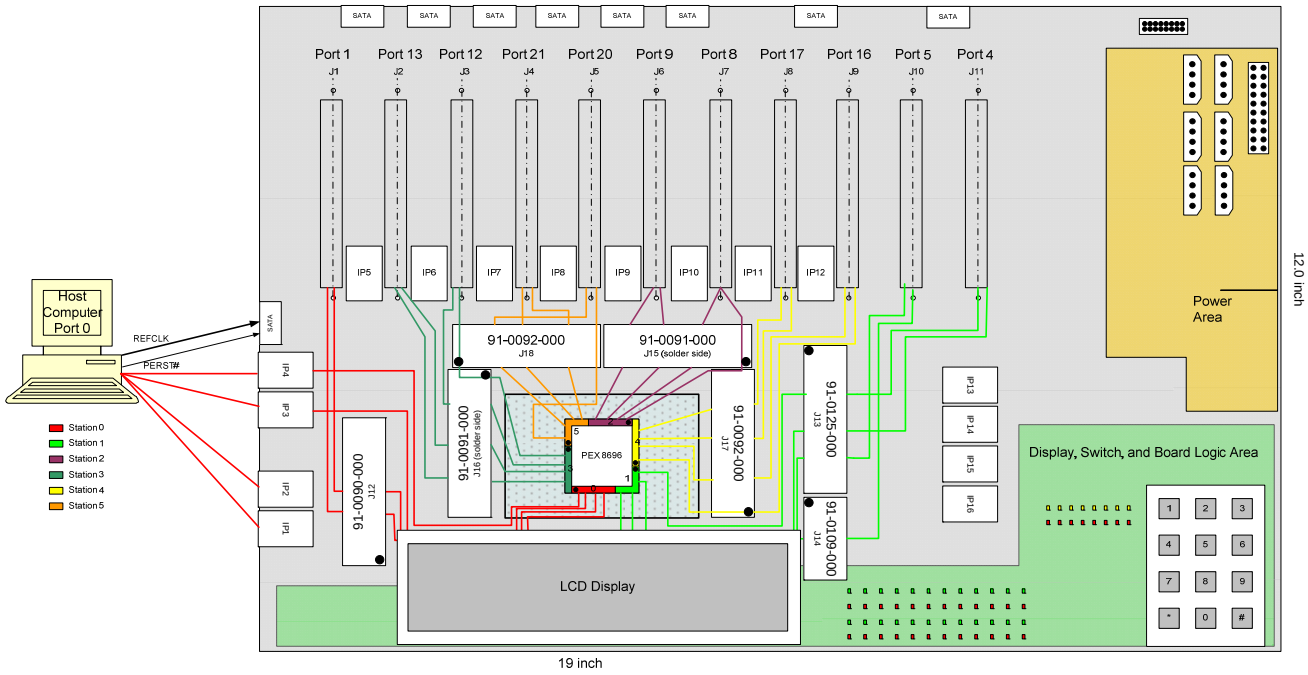


Figure 4: Station 0, x16 UP. All other Stations x8x8 DOWN. DEFAULT CONFIGURATION

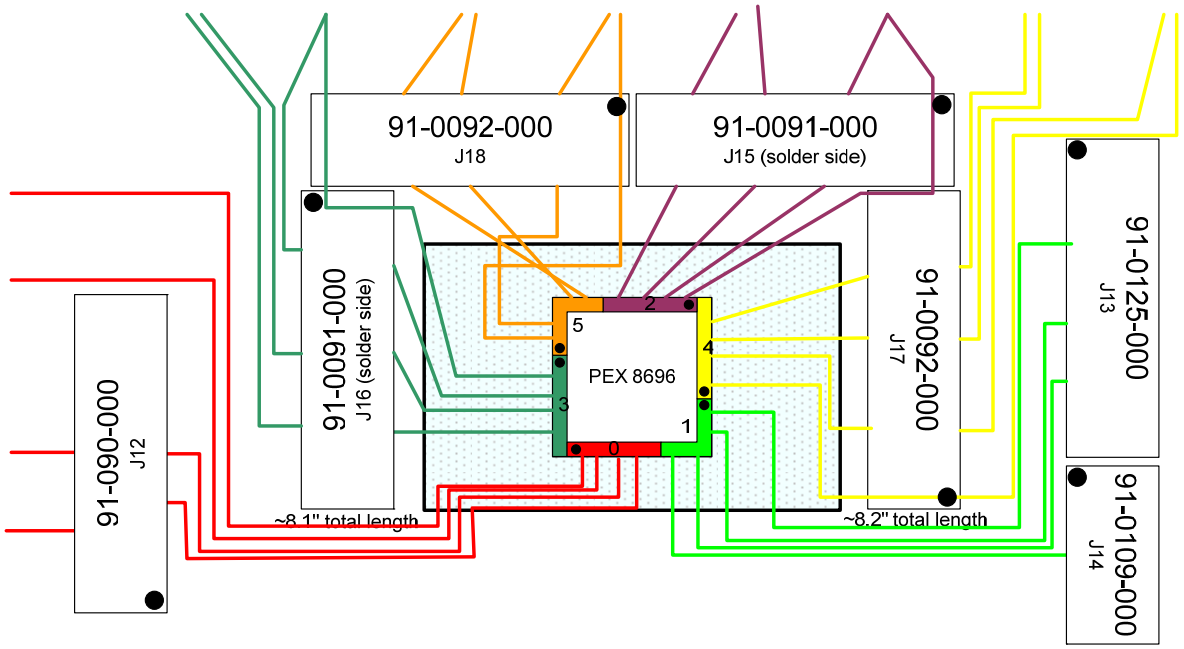


Figure 5: Configuration Modules (Station 0, x16 UP, all others x8x8 DOWN)

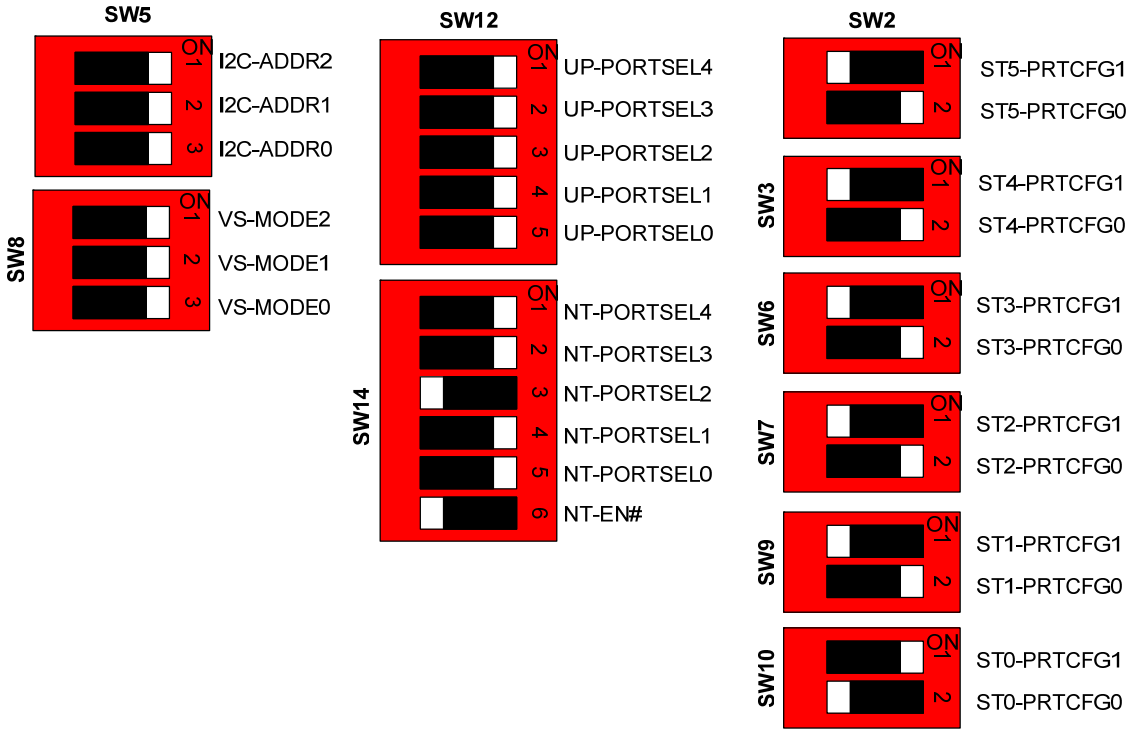


Figure 6: Default Switch Settings

3.5 Expansion Board

For configurations that have a Port width of less than x8, an Expansion board can be purchased separately that will permit access to the additional Ports. A serial ATA cable brings RefClk and global PERST# on to this board from the 8696 RDK board. Because the 8696 can have up to 8 Virtual switches, a ribbon cable header is used to bring individual PERST# signals on to this board from the 8696 RDK board, one PERST# signal per slot connector. Mini-SAS cables are used to bring the lanes on to this board from the 8696 RDK board. The lanes are routed as loosely coupled differential pairs on a 6-layer board.

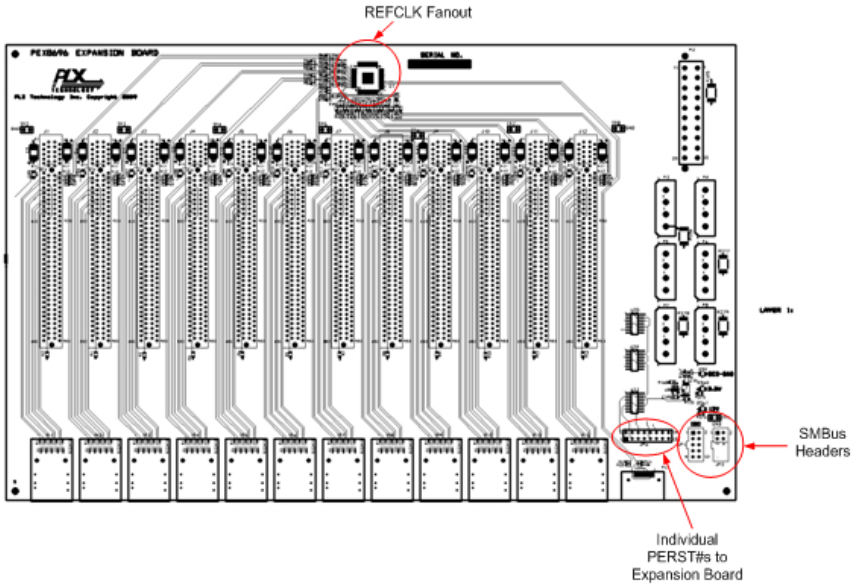


Figure 7: Expansion Board Component Placement

3.6 Non-Transparent Operation

By default, the NT Port is assigned to Port 4, by way of DIP switch SW14. To use the NT function, DIP switch SW14 is used to set the PEX 8696 switch's Strapping balls so that the switch is in NT mode. Mini-SAS connectors are used to connect to the Host on the NT Port, by way of cables.

For further details regarding the various hardware configurations for NT mode, refer to Section 3.1, "PCI Express Port Configuration."

For further details regarding DIP switch SW14, refer to Table 2: PEX 8696 RDK Board Hardware Strapping DIP Switches.

For details regarding the PEX_NT_RESET# sideband signal, refer to Section 3.17.3, "PEX_NT_RESET#."

3.7 Virtual Switch Mode

The PEX 8696 device can support up to 8 Virtual switches. Table 2 below describes what Ports are the Upstream and associated Downstream Ports for the possible Virtual switch configurations.

Table 3: Virtual Switch Configurations

# Virtual Switches Enabled	Upstream Ports (UP)	Downstream Ports (DS)
8	Port 0	Port 1,Port 2
	Port 4	Port 3,Port 5
	Port 8	Port 6,Port 7
	Port 10	Port 9,Port 11
	Port 12	Port 13,Port 14
	Port 16	Port 15,Port 17
	Port 20	Port 21,Port 18
	Port 22	Port 23,Port 19
6	Port 0	Port 1 - Port 3
	Port 4	Port 5 - Port 7
	Port 8	Port 9 - Port 11
	Port 12	Port 13 - Port 15
	Port 16	Port 17 - Port 19
	Port 20	Port 21 - Port 23
5	Port 0	Port 1 - Port 3, Port 12 - Port13
	Port 4	Port 5 - Port 7,Port 14 - Port 15
	Port 8	Port 9 - Port 11
	Port 16	Port 17 - Port 19
	Port 20	Port 21 - Port 23
4	Port 0	Port 1 - Port 3,Port 12 - Port 13
	Port 4	Port 5 - Port 7,Port 14 - Port 15
	Port 8	Port 9 - Port 11,Port 20 - Port 21
	Port 16	Port 17 - Port 19,Port 22 - Port 23
3	Port 0	Port 1 - Port 7
	Port 8	Port 9 - Port 15
	Port 16	Port 17 - Port 23
2	Port 0	Port 1 - Port 11
	Port 12	Port 13 - Port 23

Figure 8 below shows the PEX 8696 RDK board configured as all x4 Ports, with 8 Virtual switches.

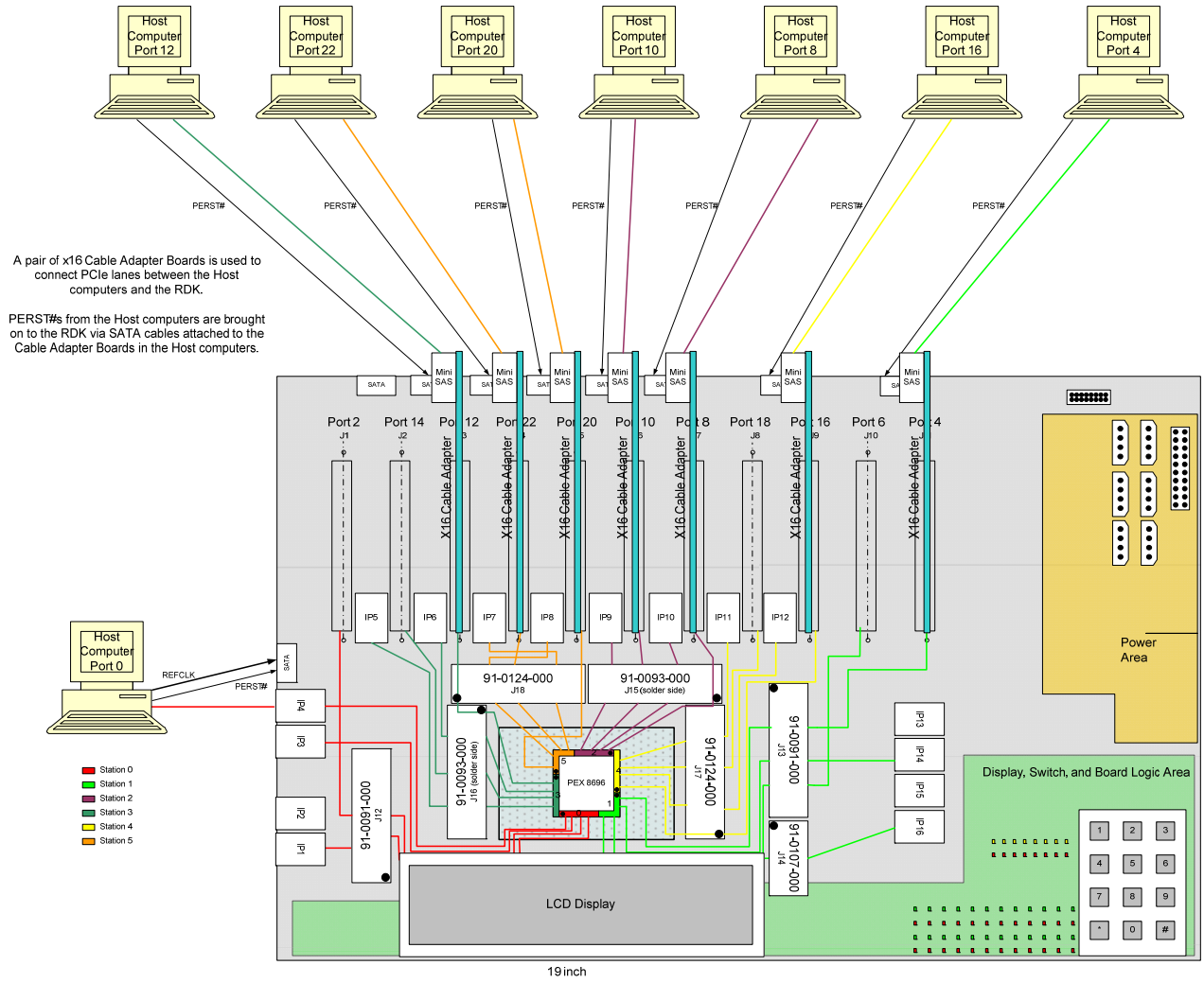


Figure 8: 8696 RDK Configured to Support 8 Virtual Switches

Pairs of Cable adapter boards are used to connect the Lanes of the Upstream ports to their host computers. Separate serial ATA connectors on the PEX 8696 RDK board are used to bring in the Virtual switch PERST#s from the host computers.

Note: *Only Upstream ports routing directly to mini-SAS connectors will be Gen2 (5.0GT/s) capable. The remaining Upstream ports that are routed through two cable adapter cards plugged into PCIe slots only support Gen1 (2.5GT/s).*

3.8 PCI Express Hot Plug Circuitry

The PEX 8696 switch supports Hot Plug on four downstream Ports, by way of dedicated 10-signal Parallel Hot Plug interfaces. In addition, a serial I^2C interface, in conjunction with an external I/O Expander IC, can be used to support Hot Plug on any Port. The PEX 8696 RDK board has external Hot Plug circuitry that supports Parallel Hot Plug to Slot 9, and Serial Hot Plug to Slot 5. A CPLD receives hot-plug signals for enabling power, RefClk, and PERST# from the PEX 8696 and I/O Expander, and drives them out to the slots. DIP switches are used to enable normal hot-plug operation, or bypass hot-plug usage and always have these slots on. These switches also emulate MRL#.

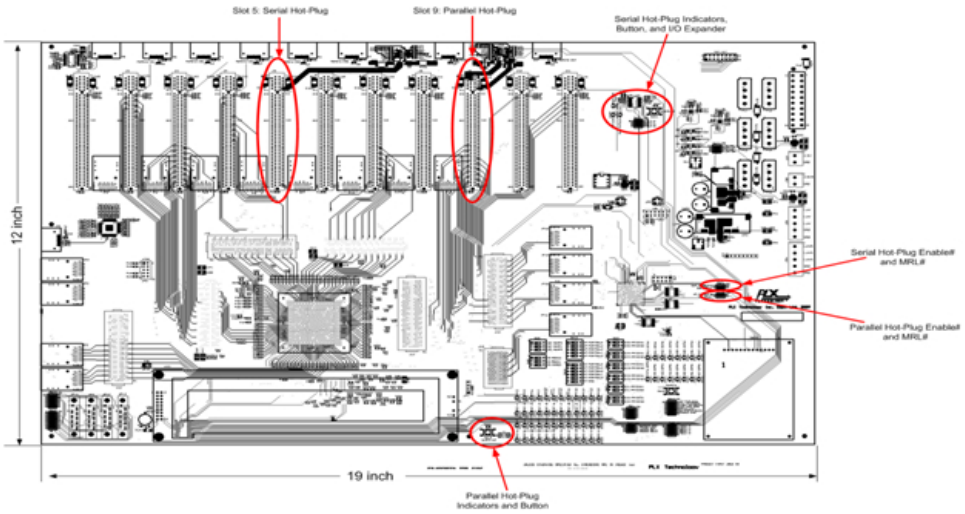


Figure 9: Hot-Plug Components Placement

The PEX 8696 RDK board supports Parallel Hot Plug on Port 16, of Station 4, which is routed to Slot 9. To support Parallel Hot Plug, Slot 9 has a dual-voltage Hot Plug Controller chip associated with it (U22), this controls power to this slot. This slot supports all port configurations up to x16. Figure 10 below is a block diagram of this hot-plug circuit.

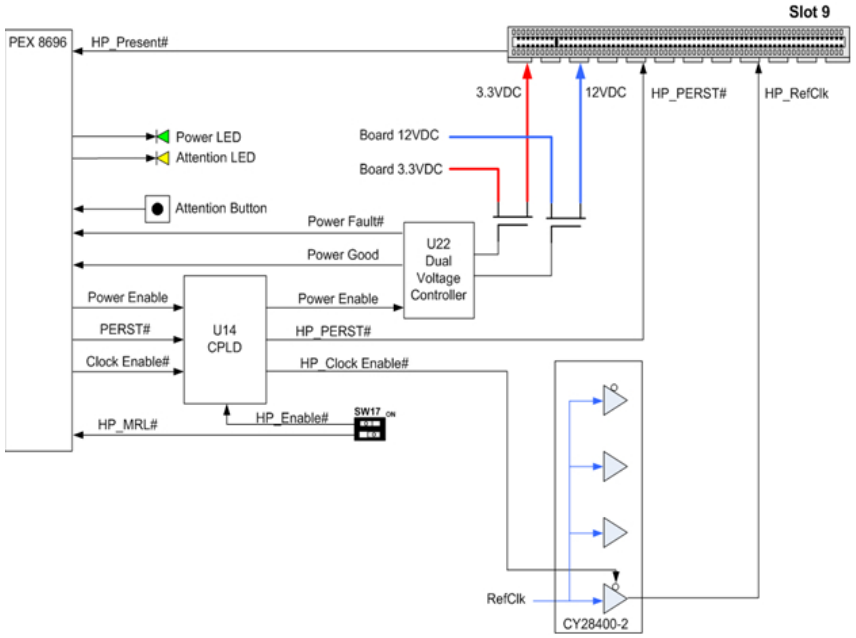


Figure 10: Parallel Hot-Plug Block Diagram

The PEX 8696 RDK board supports Serial Hot Plug on Port 20, of Station 5, which is routed to Slot 5. A serial I^2C interface, with an external I/O Expander IC (U25), supports Serial Hot Plug functionality on this slot. Slot 5 has a dual-voltage Hot Plug Controller chip associated with it (U24), this controls power to this slot. This slot supports all port configurations up to x16. Figure 11 below is a block diagram of this hot-plug circuit..

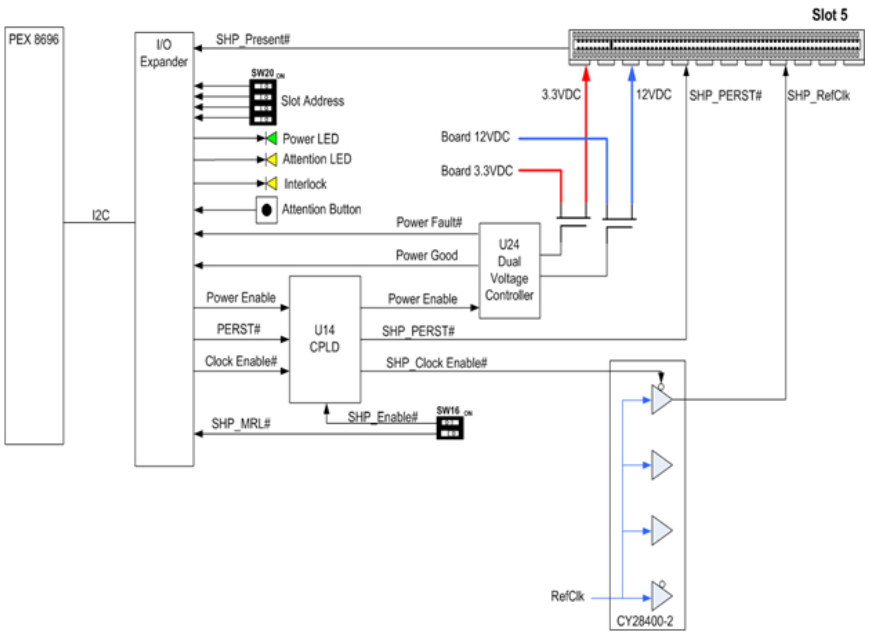


Figure 11: Serial Hot-Plug Block Diagram

3.9 Reference Clock Circuitry

The differential PCI Express RefClk is brought onto the PEX 8696 RDK board from the Host PC, by way of the PEX cable adapter board and a Serial ATA cable connection. It is used to drive a 1:12 differential fan-out buffer.

- One of these clocks connects to the PEX 8696 switch. This clock is AC coupled into the device.
- One of these clocks connects to a SATA connector (P8) that is meant to go to the Expansion board. This clock is AC coupled also.
- One of these clocks connects to a 1:4 differential fan-out buffer (U23) with output enables. This buffer drives RefClk to the two hot-plug capable slots (J5 and J9).
- The other 9 clocks connect to the remaining PCI Express slot connectors (J1-J4, J6-J8, J10-J11).

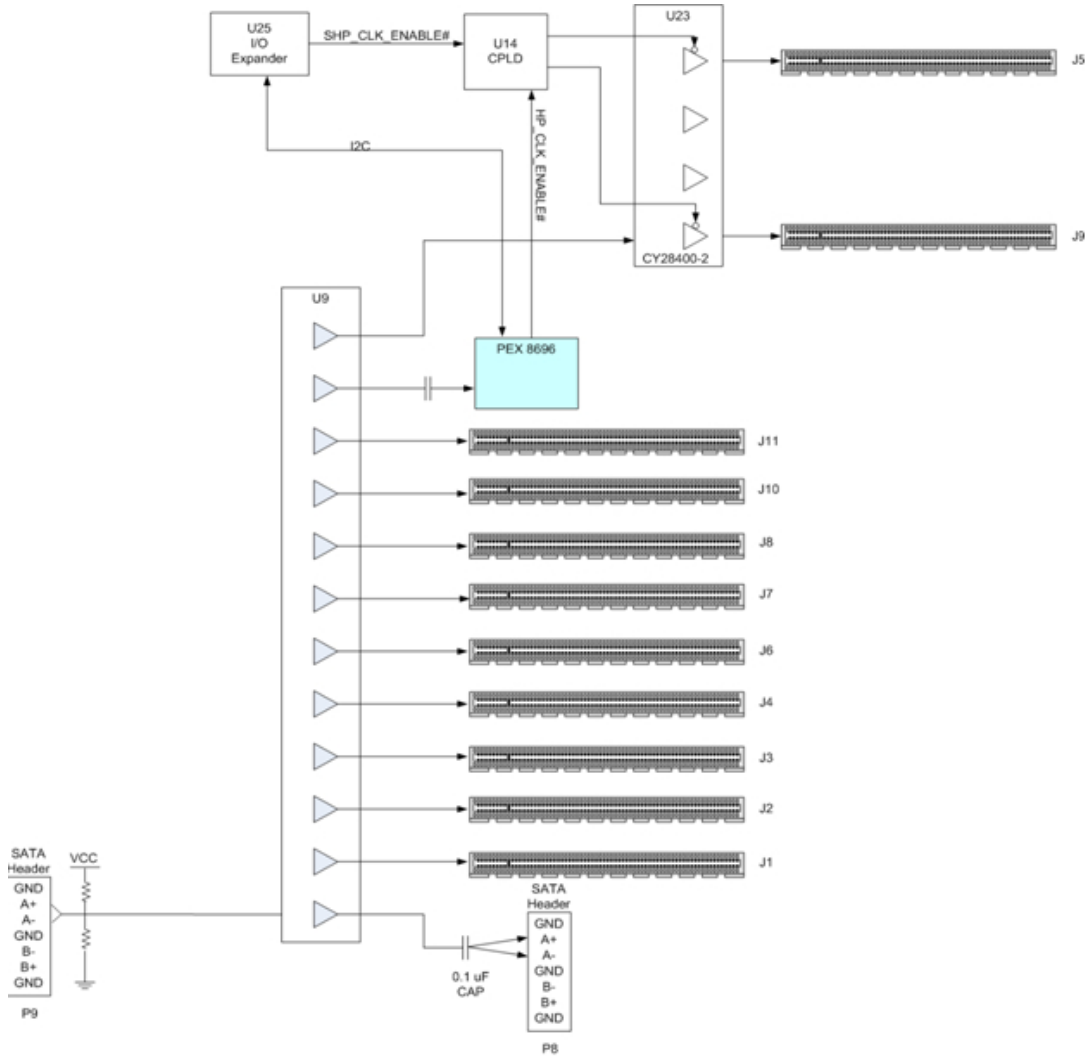


Figure 12: Reference Clock Block Diagram

3.10 PORT STATUS LED Indicators

The **PORT STATUS** indicators are green LEDs that are driven by the PEX 8696 switch's PEX_PORT_GOOD[23:0]# balls. Table 4 describes the relationship of the LED On/Off patterns as they relate to Port status.

Table 4. PEX 8696 Switch Port Status LED On/Off Patterns, by State

State	LED Pattern
Link is down	Off
Link is up, 5 GT/s, all Lanes are up	On
Link is up, 5 GT/s, reduced Lanes are up	Blinking, 0.5 seconds On, 0.5 seconds Off
Link is up, 2.5 GT/s, all Lanes are up	Blinking, 1.5 seconds On, 0.5 seconds Off
Link is up, 2.5 GT/s, reduced Lanes are up	Blinking, 0.5 seconds On, 1.5 seconds Off

3.11 LCD Display and Numeric Keypad

The PEX 8696 RDK board has a built in 40 character x 4 line LCD display. THe LCD display indicates the port configuration setting for each station as well as the Virtual Switch mode PERST# signal routing to the downstream slots. See Figure 13: LCD Module.

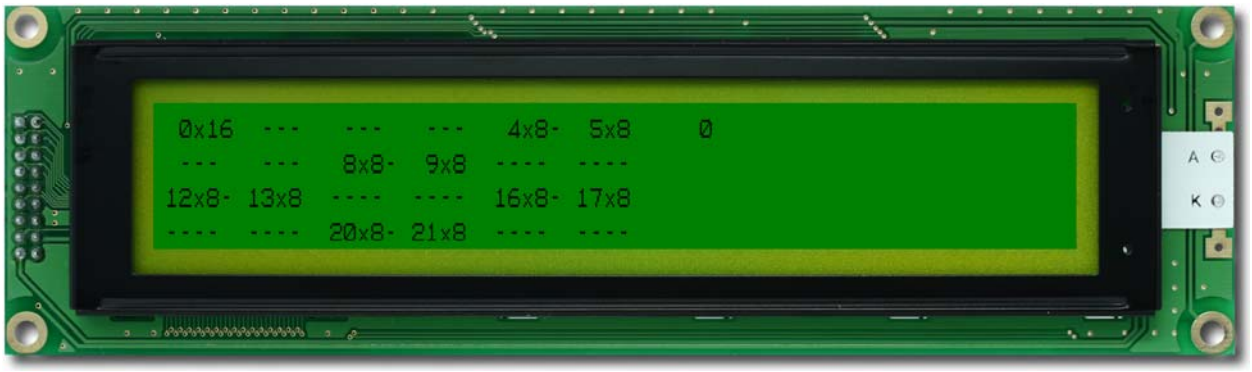


Figure 13: LCD Module

The numeric keypad is used to key in the current VS Mode to the onboard CPLD device. The CPLD then routes the Virtual Host PERST# to the downstream slots in the same virtual switch. This PERST# mapping follows the mapping that is described in Table 2. The digit in the upper right hand corner of the display indicates the current setting. Setting can be changed by keying in the VS mode (0-7), followed by the '#' character.

In above figure,, each group of numbers corresponds to each station. The first number is the port number followed by the port configuration. Ports that are not enabled based on port configuration are represented by a series of dashes. Each port is in a format nXm where n = port number and m = supported link width. There is a number on the upper right hand corner which displays the VS Mode keyed in through the keypad.

Note: *The link width shown in the LCD is the supported link width, and does not reflect the current status of the port. Please see the link width LED's for the port status.*

3.12 Power Circuitry

The PEX 8696 RDK board is a bench top board, meant to receive 3.3 VDC, 5VDC, and 12 VDC from an external ATX bench top supply. Figure 14 below illustrates the PEX 8696 RDK board power circuitry.

Note: *The user must power-up the PEX 8696 RDK board before powering up the Host computer, so that enumeration will see the PEX 8696 switch and any downstream devices. A circuit within the CPLD detects the power-up sequence between the PEX 8696 RDK base board and Host computer, and turns On a* ***red*** *LED (DS85) if an incorrect sequence occurs. An incorrect sequence is detected by monitoring PERST# from the Host computer, and a "voltage good" signal from a voltage supervisor IC (U19), which monitors board power.*

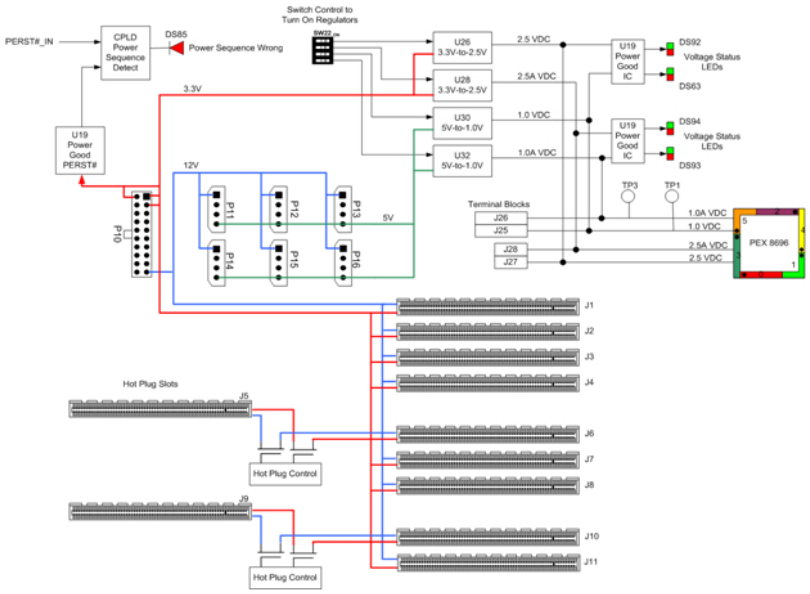


Figure 14: Power Circuit Block Diagram

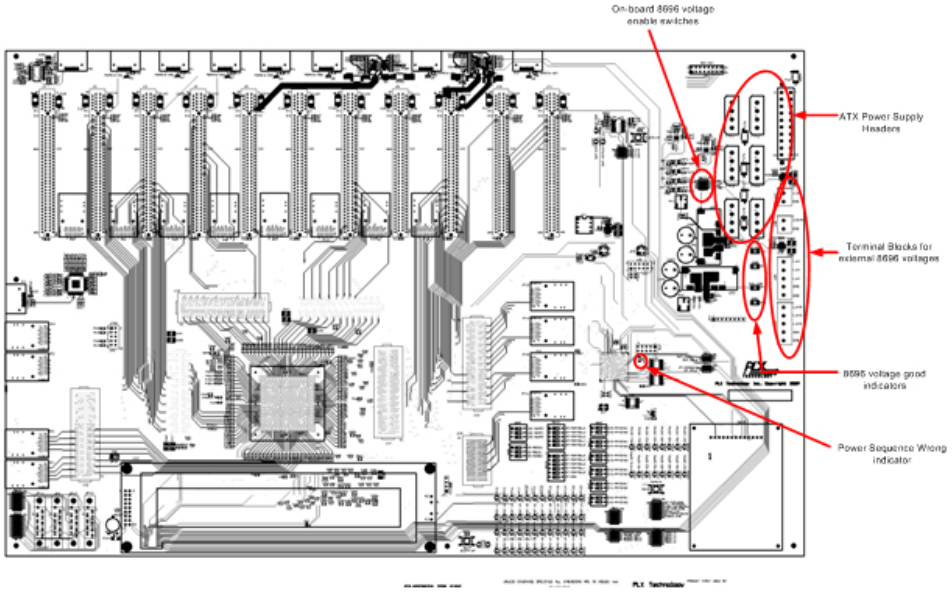


Figure 15: Power Circuit Component Placement

Dedicated power rails supply the four voltages (2.5V, 2.5VA, 1.0V, and 1.0VA) to the PEX 8696 switch, and only the PEX 8696 switch. This allows accurate current draw measurements when operating in various Port configurations and traffic levels. In the default configuration, each of these power rails is driven by on-board voltage regulators – U30 and U32 generate 1.0V and 1.0VA respectively from 5 VDC. U26 and U28 generate 2.5V and 2.5VA respectively from 3.3 VDC. For the purposes of current draw measurements or voltage margining, an external supply can be used to supply 1.0V, 1.0VA, 2.5V, and 2.5VA, using four sets of terminal blocks (J25, J26, J27, and J28). In this case, the on-board regulators are turned Off by DIP switch SW22. Bicolor **red**/**green** LED indicators are used with each of these power rails, to indicate that each voltage is within 10% of nominal.

Power to the PCI Express slot connectors is also supplied by the external ATX bench top supply. +3.3 VDC to these connectors is on one power rail, and +12 VDC to these connectors is on another. Full board loading of 75W add-in boards is supported. This requires 33A for +3.3 VDC, and 60.5A for +12 VDC. +3.3 VDC is provided by the 20-pin main connector (P10). +12 VDC is obtained from six 4-pin peripheral connectors (P11 through P16).

Note: *Load resistors are attached to the 3.3, 5, and 12 VDC ATX power rails, to ensure that if the PEX 8696 RDK board is lightly loaded, the ATX supply used will still be able to regulate its voltages.*

Power to Slot 5 (Port 20) is controlled by a dual-voltage, Hot Plug Controller chip (U24), which is controlled by the PEX 8696 switch's Parallel Hot Plug interface. If Port 20 is the upstream Port, the Strapping signals that Set the upstream Port are used to always keep this dual-voltage controller chip turned On.

Power to Slot 9 (Port 16) is also controlled by a dual-voltage, Hot Plug Controller chip (U22), which is controlled by the PEX 8696 switch's Serial Hot Plug interface. If Port 16 is the upstream Port, the Strapping signals that Set the upstream Port are used to always keep this dual-voltage controller chip turned On.

3.13 Reset Circuitry

The PEX 8696 RDK base board accepts a PERST# from the Host computer, using a SATA cable connection. The signal is ORed with a manual Reset circuit. This ORed signal connects to the PEX 8696 switch's PEX_PERST# Input ball, and the downstream slots' PERST# connector pins. However, in the case where Slot 5 or Slot 9 is not an upstream slot, PERST# to these slots is controlled by their respective Hot Plug interfaces.

The manual Reset circuit consists of a voltage supervisor chip (U19), and pushbutton switch (SW18) to Reset input of that chip. The voltage supervisor monitors 3.3 VDC and Reset input. If the Reset input is Low, or the supply rail is out of range, the Reset output is held asserted. When both conditions no longer exist, the Reset output de-asserts after a programmable Reset Timeout period (128.6 ms, by default).

Because the PEX 8696 device can support up to 8 Virtual switches, one or more Virtual switches and their Downstream Ports could be in Reset, while the remainder are not. Therefore, individual PERST# signals are driven to each slot connector on the 8696 RDK board. A ribbon cable connects individual PERST# signals from the 8696 RDK board to each slot on the Expansion board. A bank of red LEDs (one for each connector, and one for the 8696 device) indicates assertion of each of the individual PERST# signals.

3.14 Serial EEPROM Interface (U11)

The PEX 8696 RDK board includes a socketable serial EEPROM (Mill-Max AT25128A) (U11). The EEPROM is powered from a 2.5V supply that is separate from the 8696 device. This keeps the interface from the 8696 to the EEPROM within EEPROM specs, and keeps the 8696 on a separate 2.5V power rail. The serial EEPROM contents can be used to initialize the PEX 8696 switch, after power-on reset.

3.15 JTAG Interface (JP2)

The PEX 8696 RDK board includes a dedicated 2x5 JTAG header (JP2) to the PEX 8696 switch. (Refer to Figure 16) The 10-pin connector is designed to allow a direct interface to third-party JTAG TAP Controllers, *such as* the Corelis USB-1149.1/E Controller. The header provides connections for TCK, TDI, TDO, TMS, TRST#, and GND.

There is no "standard" JTAG header pin arrangement; therefore, JTAG header type and pin assignments are arbitrary. The header and pin assignment chosen for the PEX 8696 RDK board is compatible with the Corelis JTAG single TAP cable (AS00790050-A0).

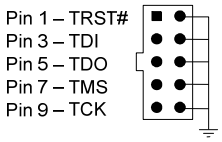


Figure 16: JTAG Header (Top View)

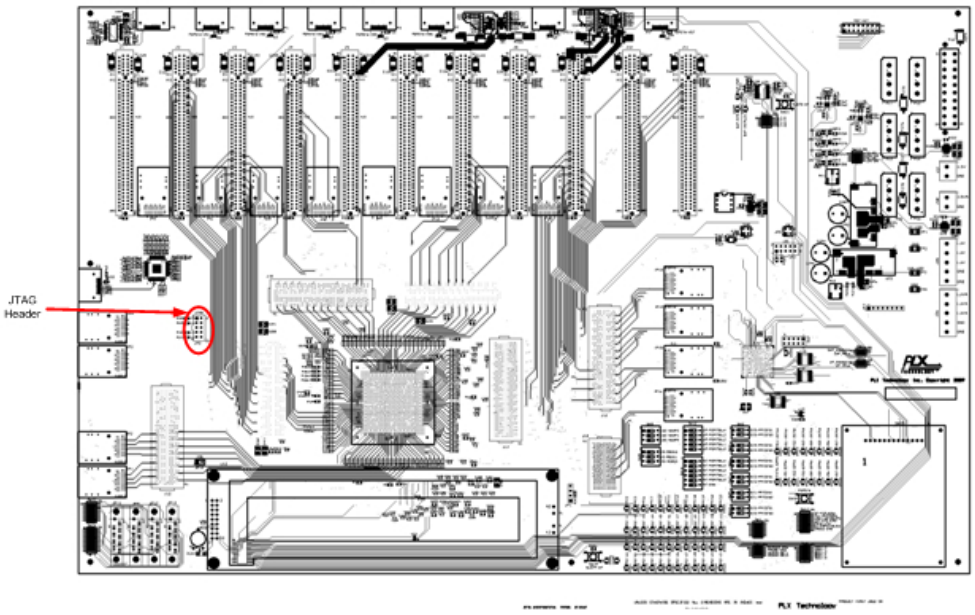


Figure 17: JTAG Header Component Placement

3.16 I²C Interface (JP3 and JP5)

The PEX 8696 RDK base board includes a two-wire, I²C-compatible Slave mode interface, with 3-bit addressing. Through this out-of-band Channel, users can read, write, and configure the PEX 8696 switch's internal registers, run internal output Probe mode, monitor Error Counters, and monitor other PEX 8696 switch statuses. The PEX 8696 RDK base board provides two 2x2 pin headers (JP3 and JP5), which interface to the PEX 8696 switch's I²C Port, to allow chaining of multiple boards.

There is no "standard" I²C header pin arrangement; therefore, I²C header type and pin assignments are arbitrary. The connector pin assignment shown below is compatible with the TotalPhase Aardvark I2C/SPI Host Adapter (Part Number: TP240141). The lower three bits of the I²C Slave address selection is determined by a DIP switch setting (SW5).

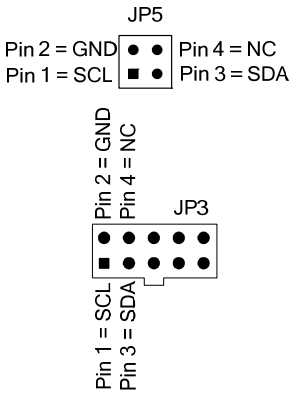


Figure 18: I2C Headers (Top View)

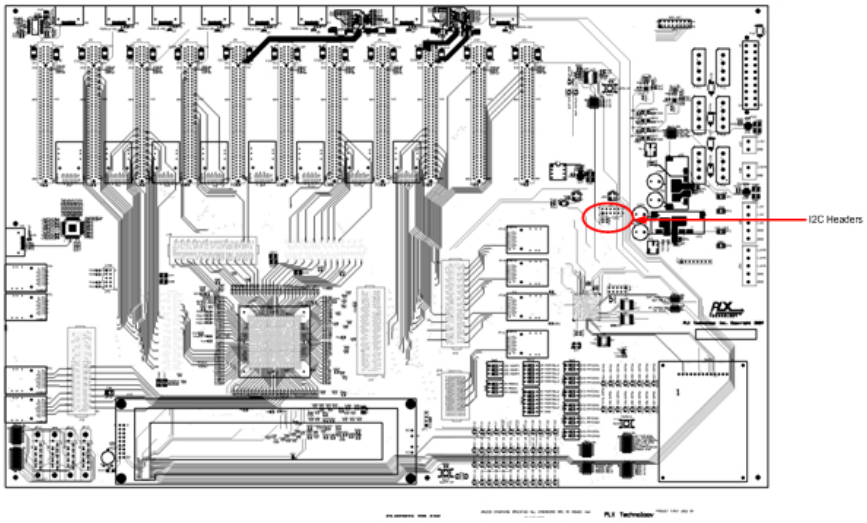


Figure 19: I2C Header Placement

3.17 Device-Specific Sideband Signals

The PEX 8696 switch has three device-specific sideband signals – FATAL_ERR#, PEX_INTA#, and PEX_NT_RESET#.

3.17.1 FATAL_ERR#

FATAL_ERR# (Conventional PCI SERR# equivalent) output is used to indicate when the PEX 8696 switch detects a Fatal, Unrecoverable error.

There are up to eight FATAL_ERR# outputs. FATAL_ERR# is used in Base mode (Mode-1), and for Virtual Switch 0 in Virtual Switch mode (Virtual Switch mode). VS[7:1]_FATAL_ERR# for Virtual Switches 1 to 7 are used only in Virtual Switch mode. The eight FATAL_ERR# signals drive **red** LED indicators, DS29 to DS36.

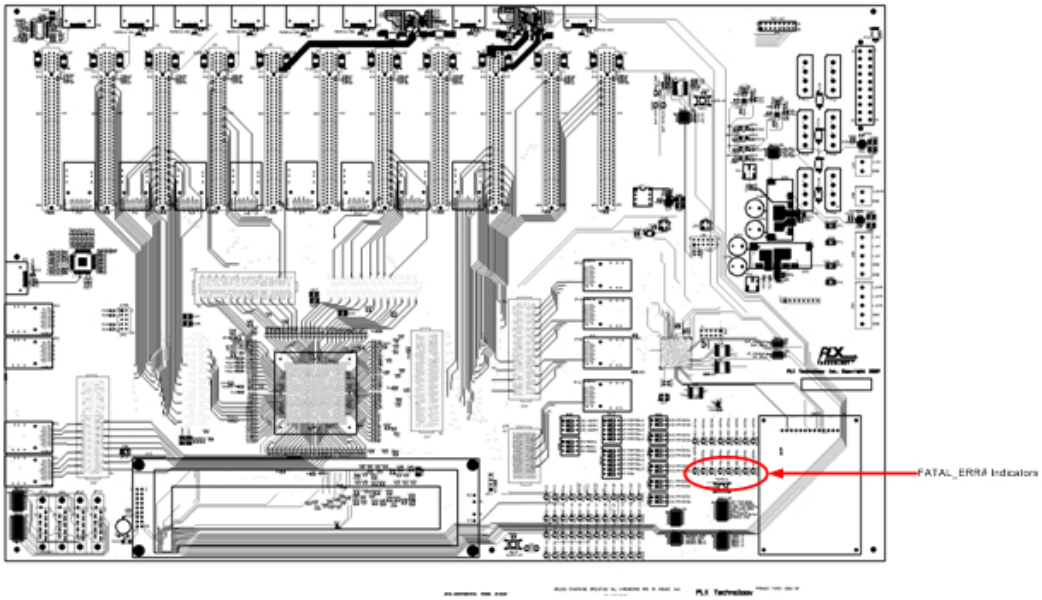


Figure 20: Fatal Error Indicators

3.17.2 PEX_INTA#

PEX_INTA# output is an open-drain output that is used for Conventional PCI INTA# signal compatibility. There are a number of events that can trigger this signal, refer to the data book for more details.

There are up to eight PEX_INTA# outputs. PEX_INTA# is used in Base mode (Mode-1), and for Virtual Switch 0 in Virtual Switch mode (Virtual Switch mode). VS[7:1]_PEX_INTA# for Virtual Switches 1 to 7 are used only in Virtual Switch mode. The eight PEX_INTA# signals drive **yellow** LED indicators, DS21 to DS28.

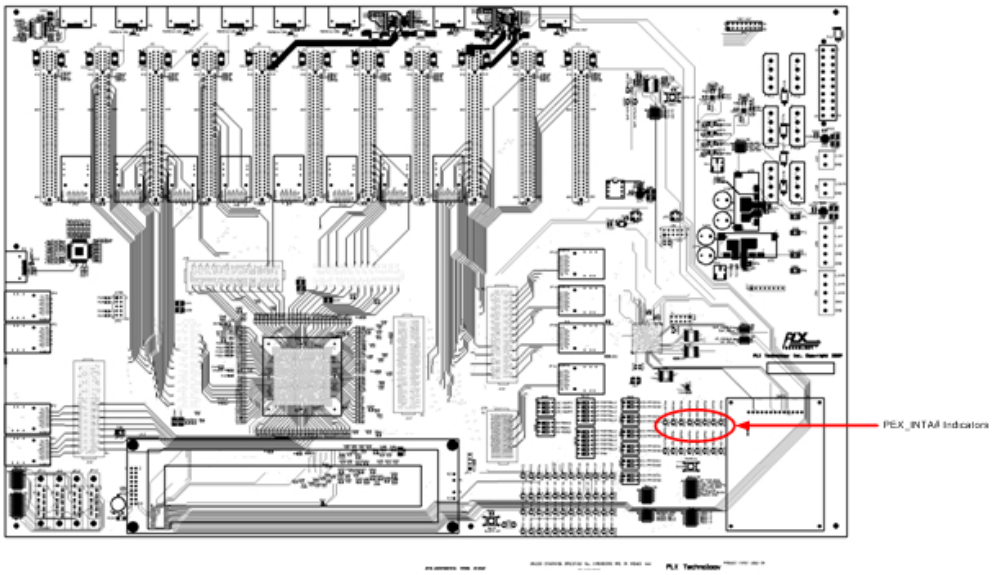


Figure 21: INTA# Indicator Placement

3.17.3 PEX_NT_RESET#

PEX_NT_RESET# output is used to signal the reception of a Hot Reset from the NT Port Link Interface to the NT Port Virtual Interface. This signal is brought out to a test point via on the PEX 8696 RDK board, so that the PEX_NT_RESET# signal ball can be accessed.

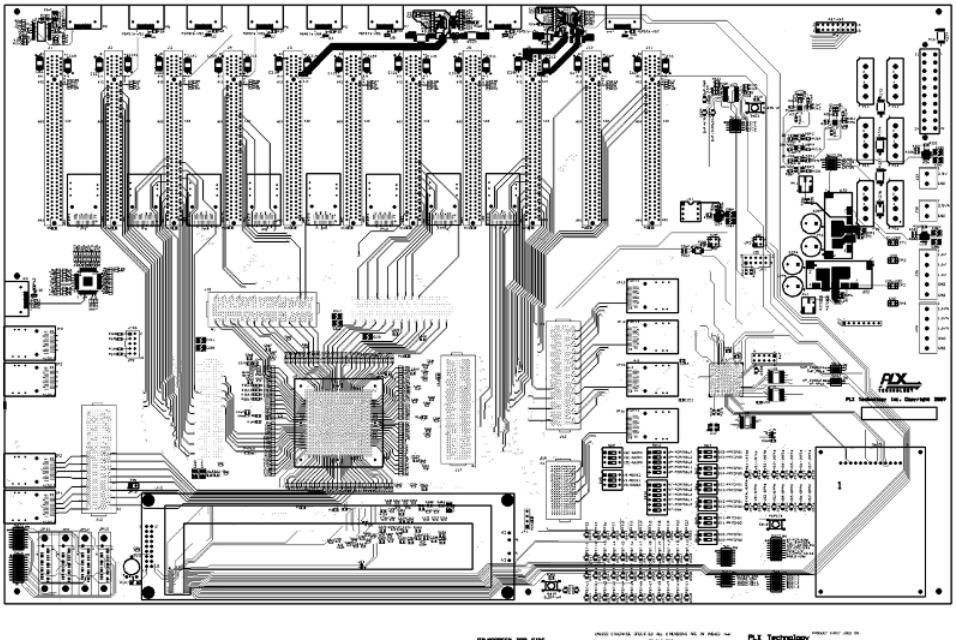


Figure 22: PEX_NT_RESET Via Placement

4 Sample Board Configurations

The following section shows more configurations (not all) possible with the RDK. See previous sections for detailed configuration options.

4.1 Configuration x8x4x4

In this configuration, upstream port is x8, and connected through the cable. It shows the expander board needed to access all the ports available.

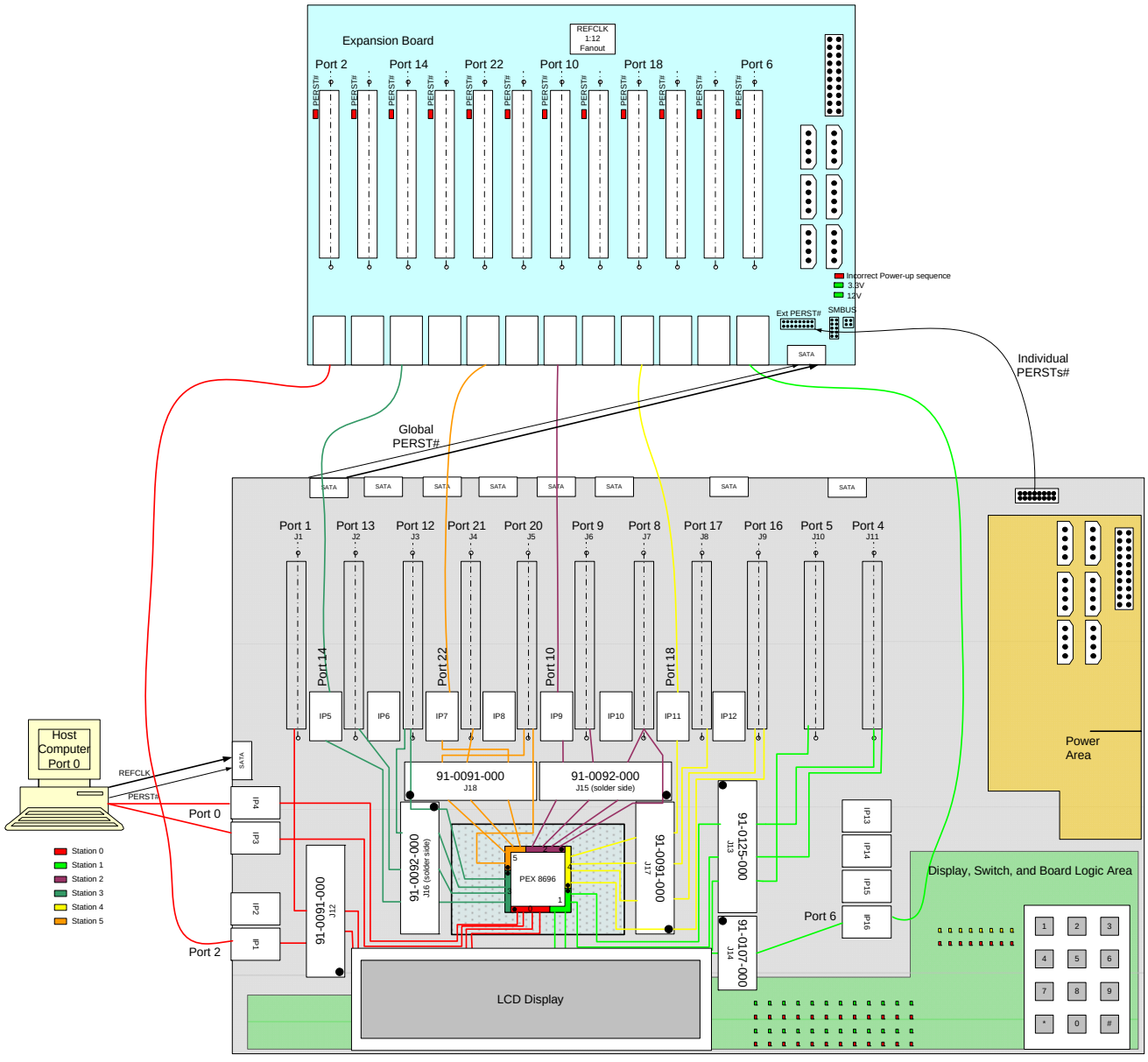


Figure 23: All Stations are x8x4x4

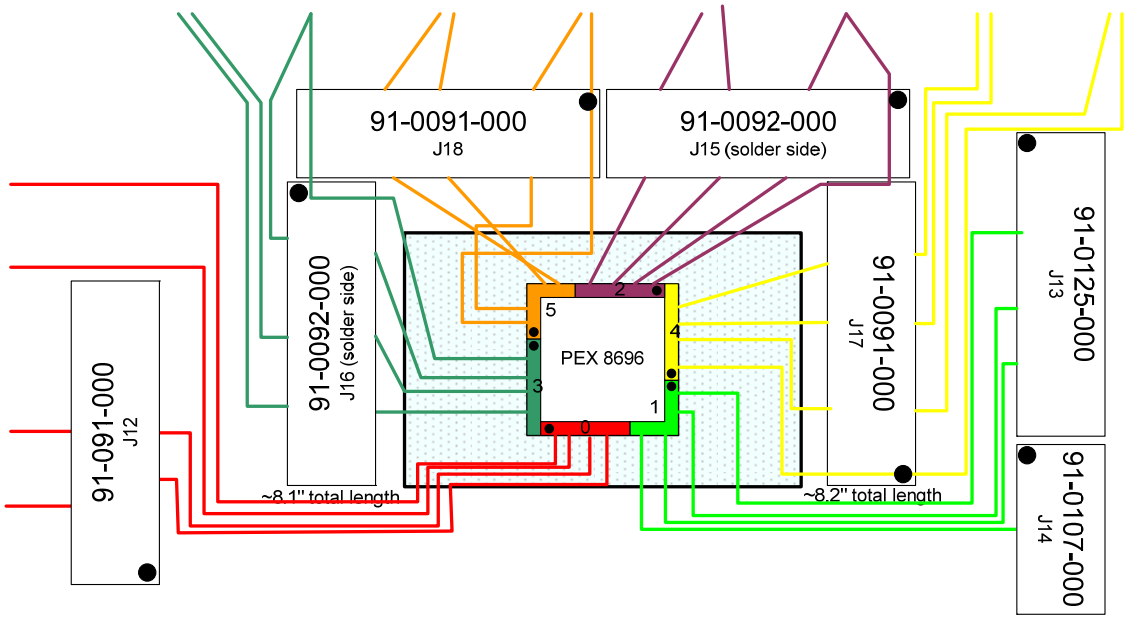


Figure 24: Configuration Modules (x8x4x4)

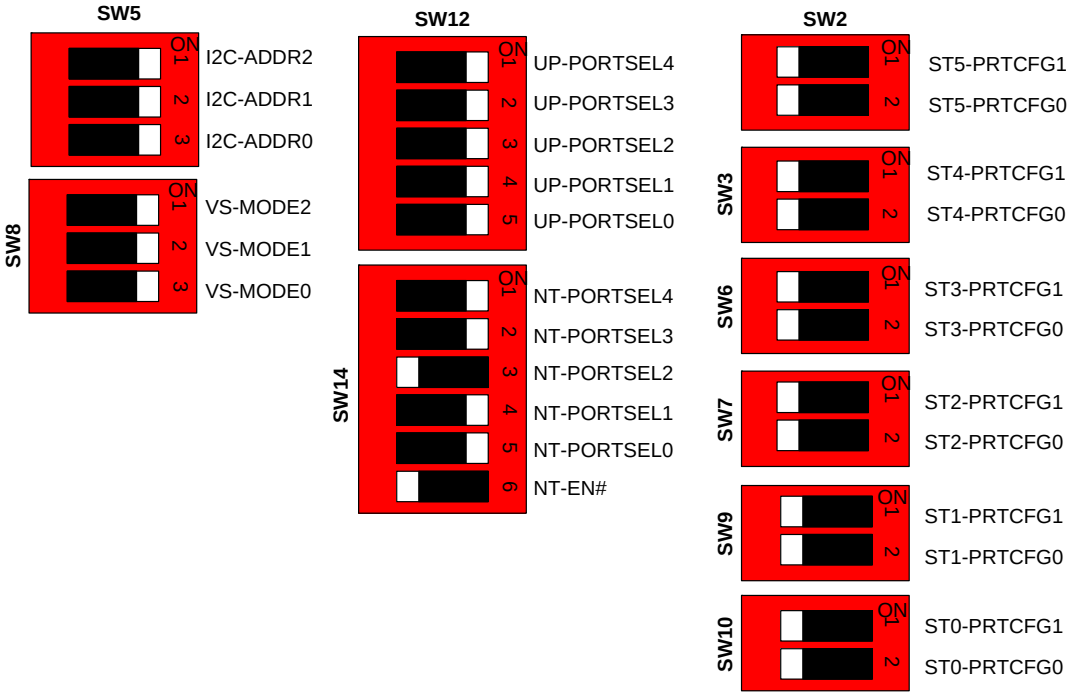


Figure 25: Switch Settings (x8x4x4)

4.2 Configuration x4x4x4x4

In this configuration, all 24 ports are accessible and all stations are configured as x4x4x4x4.

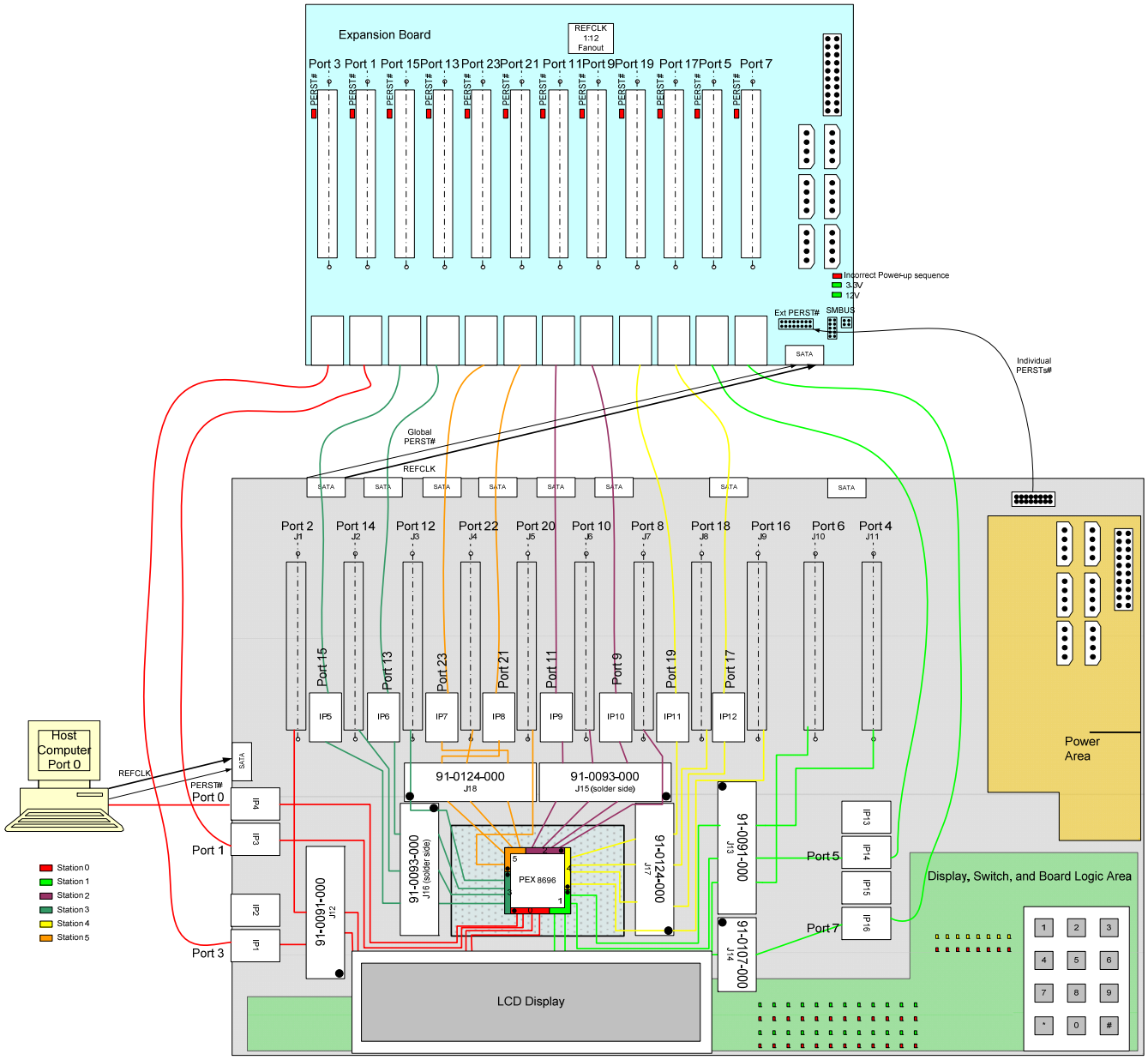


Figure 26: All Stations are x4x4x4x4

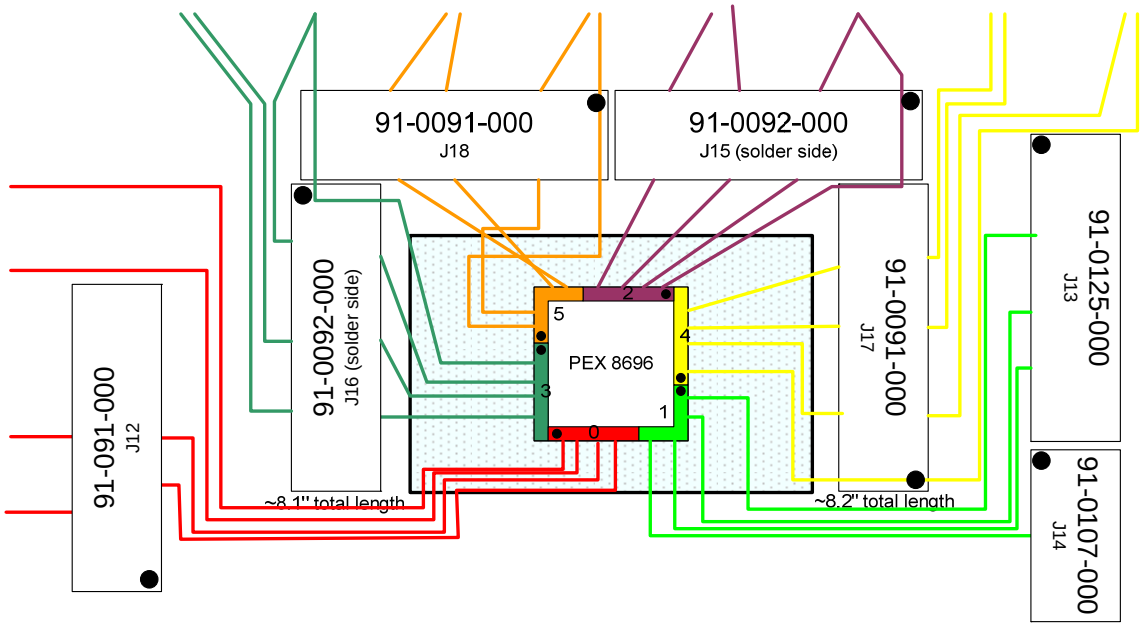


Figure 27: Configuration Modules (x4x4x4x4)

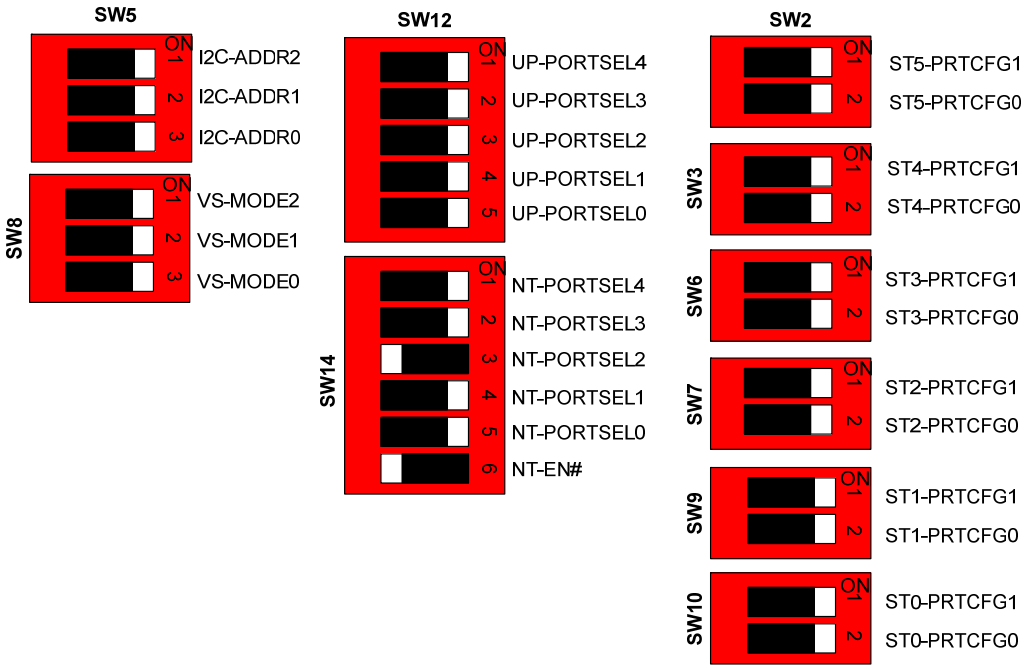


Figure 28: Switch Settings (x4x4x4x4)

4.3 Configuration Station 0 x8 UP, All Other Stations x16, NT Port

In this configuration, NonTransparent mode is enabled. The Figure below shows 2 hosts, one on station 0 and the NT host on station 1.

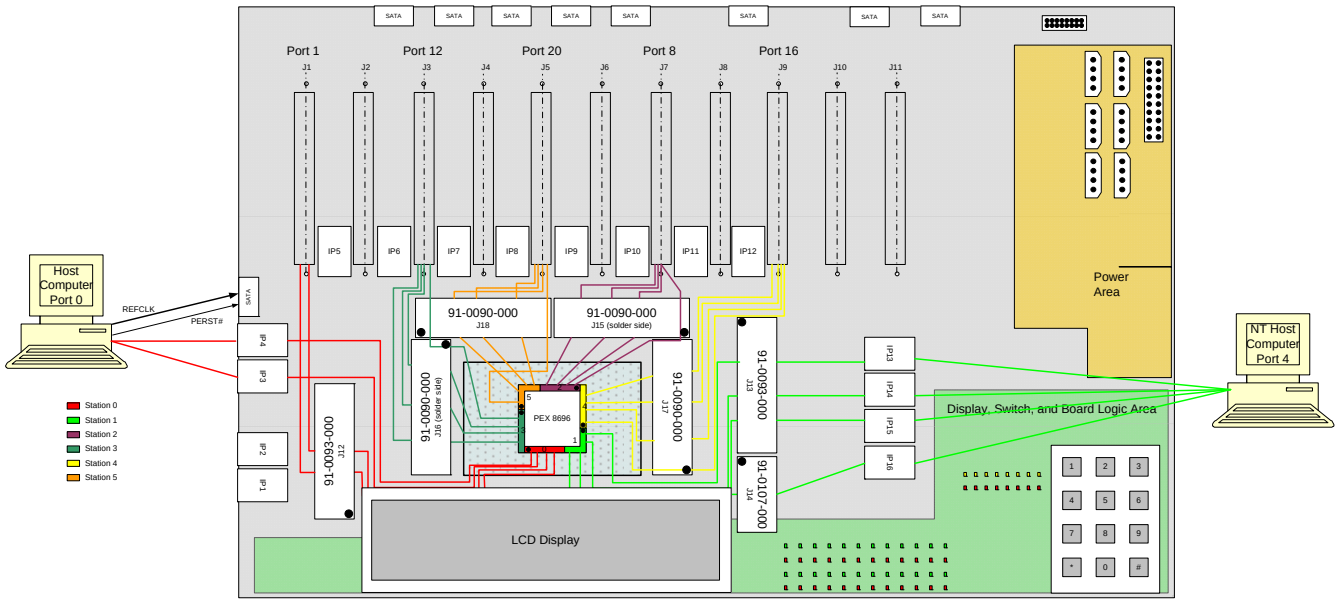


Figure 29: Station 0, x8 UP. Station 1, x16 NT. All Other Stations x16 DOWN.

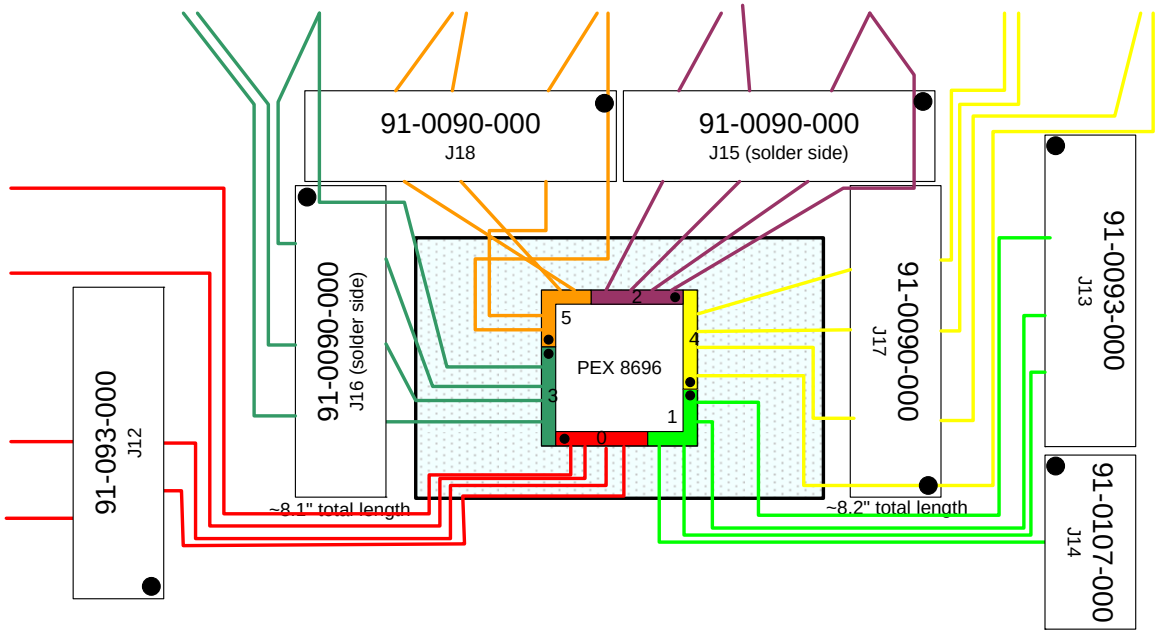


Figure 30: Configuration Modules (Station 0 x8 UP, Station1 x16NT, All Other Stations x16)

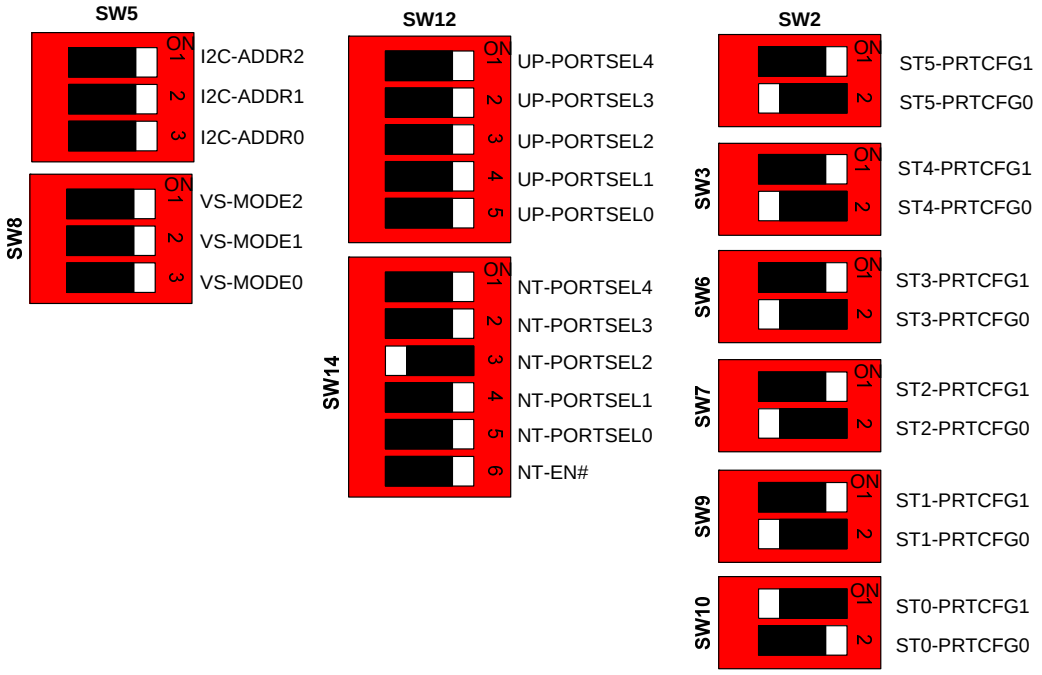


Figure 31: Switch Settings (Station 0 x8 UP, Station1 x16NT, All Other Stations x16)

5 Troubleshooting Tips

The following section contains some information to check in case of linkup issues while using the RDK.

- *PLX recommends an override of the Signal Detect Level for 8696 lanes in the RDK that traverse cables. This allows for the signal path losses of these long links. The EEPROMs shipped have these adjustments for port 0, which is the upstream connection to the host*

- *Only Upstream ports routing directly to mini-SAS connectors will be Gen2 (5.0GT/s) capable. The remaining Upstream ports that are routed through two cable adapter cards plugged into PCIe slots only support Gen1 (2.5GT/s).*

- *Some PC motherboards have repeater / de-mux buffers on some slots. These slots usually come in pairs and are automatically configured as 1 x16 slot or 2 x8 slots depending on how many add-in cards are plugged in. If possible, connect the cable card adapter on the slot that does NOT have these repeaters for better results.*

- *Upstream link quality can also be improved by overriding values in the Receiver Equalization Level registers.*

6 PEX8696-16U8D BB RDK Bill Of Materials and Schematic

Item	Qty	Manufacturer	Manufacturer Part Number	Description	Package	Reference
SURFACE MOUNT COMPONENTS						
1	223	Kemet	C0402C104K8PACTU	CAP .10UF 10V CERAMIC X5R 0402	SMT, 0402	C1,C2,C3,C4,C5,C6,C7,C8,C9,C10,C11,C12,C13,C14,C15,C16,C17,C18,C19,C20,C21,C22,C23,C24,C25,C26,C27,C28,C29,C30,C31,C32,C33,C34,C35,C36,C37,C38,C39,C40,C41,C42,C43,C44,C45,C46,C47,C48,C49,C50,C51,C52,C53,C54,C55,C56,C57,C58,C59,C60,C61,C62,C63,C64,C71,C72,C73,C74,C75,C76,C77,C78,C79,C80,C81,C82,C83,C84,C85,C86,C87,C88,C89,C90,C91,C92,C93,C94,C95,C96,C97,C98,C99,C100,C101,C102,C103,C104,C105,C106,C107,C108,C109,C110,C111,C112,C113,C114,C115,C116,C117,C118,C119,C120,C121,C122,C123,C124,C125,C126,C127,C128,C129,C130,C131,C132,C133,C134,C143,C144,C145,C146,C147,C148,C149,C150,C151,C152,C153,C154,C155,C156,C157,C158,C159,C160,C161,C162,C163,C164,C165,C166,C167,C168,C169,C170,C171,C172,C173,C174,C175,C176,C177,C178,C179,C180,C181,C182,C183,C184,C185,C186,C187,C188,C189,C190,C191,C192,C193,C194,C195,C196,C197,C198,C199,C200,C201,C202,C203,C204,C205,C206,C224,C225,C226,C227,C228,C229,C230,C231,C232,C233,C234,C235,C236,C237,C238,C239,C240,C241,C242,C243,C244,C245,C246,C247,C250,C259,C261,C262,C272,C288,C293
2	22	AVX	TAJC226K020R	CAP TANTALUM 22UF 20V 10% SMD	EIA size C	C65,C66,C67,C68,C69,C70,C135,C136,C137,C138,C139,C140,C141,C142,C207,C208,C209,C210,C211,C212,C213,C214
3	26	Kemet	C0603C104K4RACTU	CAP .10UF 16V CERAMIC X7R 0603	SMT, 0603	C215,C216,C217,C218,C219,C220,C221,C222,C223,C248,C251,C252,C253,C254,C255,C256,C257,C258,C263,C264,C273,C274,C275,C276,C280,C281
4	2	Panasonic	ECJ-1VB1H473K	CAP .047UF 50V CERAMIC X7R 0603	SMT, 0603	C260,C279
5	68	Panasonic	ECJ-0EB1C103K	CAP 10000PF 16V CERAMIC 0402 SMD	SMT, 0402	C265,C266,C267,C268,C298,C299,C300,C301,C302,C303,C304,C305,C318,C319,C320,C321,C322,C323,C324,C325,C334,C335,C336,C337,C338,C339,C340,C350,C370,C371,C372,C373,C374,C375,C376,C377,C396,C397,C398,C399,C400,C401,C402,C403,C459,C460,C461,C462,C463,C464,C465,C466,C517,C518,C519,C520,C521,C522,C523,C524,C565,C566,C567,C568,C569,C570,C571,C572
6	3	Panasonic	ECJ-3YB1C106M	CAP 10UF 16V CERAMIC X5R 1206 LOVOLT FOOTPRINT	SMT, 1206, LoVolt	C269,C291,C296

Item	Qty	Manufacturer	Manufacturer Part Number	Description	Package	Reference
7	14	Kemet	C1206C226K9PACTU	CAP 22UF 6.3V CER X5R SMD 1206 LOVOLT FOOTPRINT	SMT, 1206, LoVolt	C282,C283,C284,C285,C286,C287,C315,C317,C358,C360,C363,C391,C471,C488
8	34	Kemet	C0603C105K8PACTU	CAP CERAMIC 1.0UF 10V X5R 0603, 2 VIA	SMT, 0603, 2via	C292,C297,C306,C307,C308,C309,C326,C327,C328,C329,C341,C342,C343,C344,C378,C379,C380,C381,C404,C405,C406,C407,C467,C468,C469,C470,C525,C526,C529,C532,C573,C574,C575,C576
9	206	Panasonic	ECJ-ZEB1E102K	CAP 1000PF 25V CERAMIC X7R 0201	SMT, 0201	C310,C311,C312,C313,C314,C316,C330,C331,C332,C333,C345,C346,C347,C348,C349,C351,C352,C353,C354,C355,C356,C357,C359,C361,C362,C364,C365,C366,C367,C368,C369,C382,C383,C384,C385,C386,C387,C388,C389,C390,C392,C393,C394,C395,C408,C409,C410,C411,C412,C413,C414,C415,C416,C417,C418,C419,C420,C421,C422,C423,C424,C425,C426,C427,C428,C429,C430,C431,C432,C433,C434,C435,C436,C437,C438,C439,C440,C441,C442,C443,C444,C445,C446,C447,C448,C449,C450,C451,C452,C453,C454,C455,C456,C457,C458,C472,C473,C474,C475,C476,C477,C478,C479,C480,C481,C482,C483,C484,C485,C486,C487,C489,C490,C491,C492,C493,C494,C495,C496,C497,C498,C499,C500,C501,C502,C503,C504,C505,C506,C507,C508,C509,C510,C511,C512,C513,C514,C515,C516,C527,C528,C530,C531,C533,C534,C535,C536,C537,C538,C539,C540,C541,C542,C544,C545,C546,C547,C548,C549,C550,C551,C552,C553,C554,C555,C556,C557,C558,C559,C560,C561,C562,C563,C564,C577,C578,C579,C580,C581,C582,C583,C584,C585,C586,C587,C588,C589,C590,C591,C592,C593,C594,C595,C596,C597,C598,C599,C600,C601,C602,C603,C604,C605,C606,C607,C608
10	1	Kemet	C0402C222K5RACTU	CAP 2200PF 50V CERAMIC X7R 0402	SMT, 0402	C609
11	11	Lumex	SML-LXT0805YW-TR	LED THIN 585NM YEL DIFF 0805 SMD, 10 mA	SMT, 0805	DS21,DS22,DS23,DS24,DS25,DS26,DS27,DS28,DS86,DS89,DS90
12	33	Panasonic	LNJ206R5AUX	LED RED S-J TYPE 0805, 5mA	SMT, 0805	DS29,DS30,DS31,DS32,DS33,DS34,DS35,DS36,DS61,DS62,DS63,DS64,DS65,DS66,DS67,DS68,DS69,DS70,DS71,DS72,DS73,DS74,DS75,DS76,DS77,DS78,DS79,DS80,DS81,DS82,DS83,DS84,DS85
13	26	Panasonic	LNJ306G5UUX	LED GREEN S-J TYPE 0805, 10mA	SMT, 0805	DS37,DS38,DS39,DS40,DS41,DS42,DS43,DS44,DS45,DS46,DS47,DS48,DS49,DS50,DS51,DS52,DS53,DS54,DS55,DS56,DS57,DS58,DS59,DS60,DS87,DS88
14	4	CML Innovative	CMD15-22SRUGC/TR8	LED RED/GREEN CLEAR 1206 SMD		DS91,DS92,DS93,DS94
15	16	Molex	757830036	Connector, right angle with shell 0.8mm pitch for mini-SAS,4x 26 CKT internal cable,	shell TH, SMT 26-pin connector	IP1,IP2,IP3,IP4,IP5,IP6,IP7,IP8,IP9,IP10,IP11,IP12,IP13,IP14,IP15,IP16

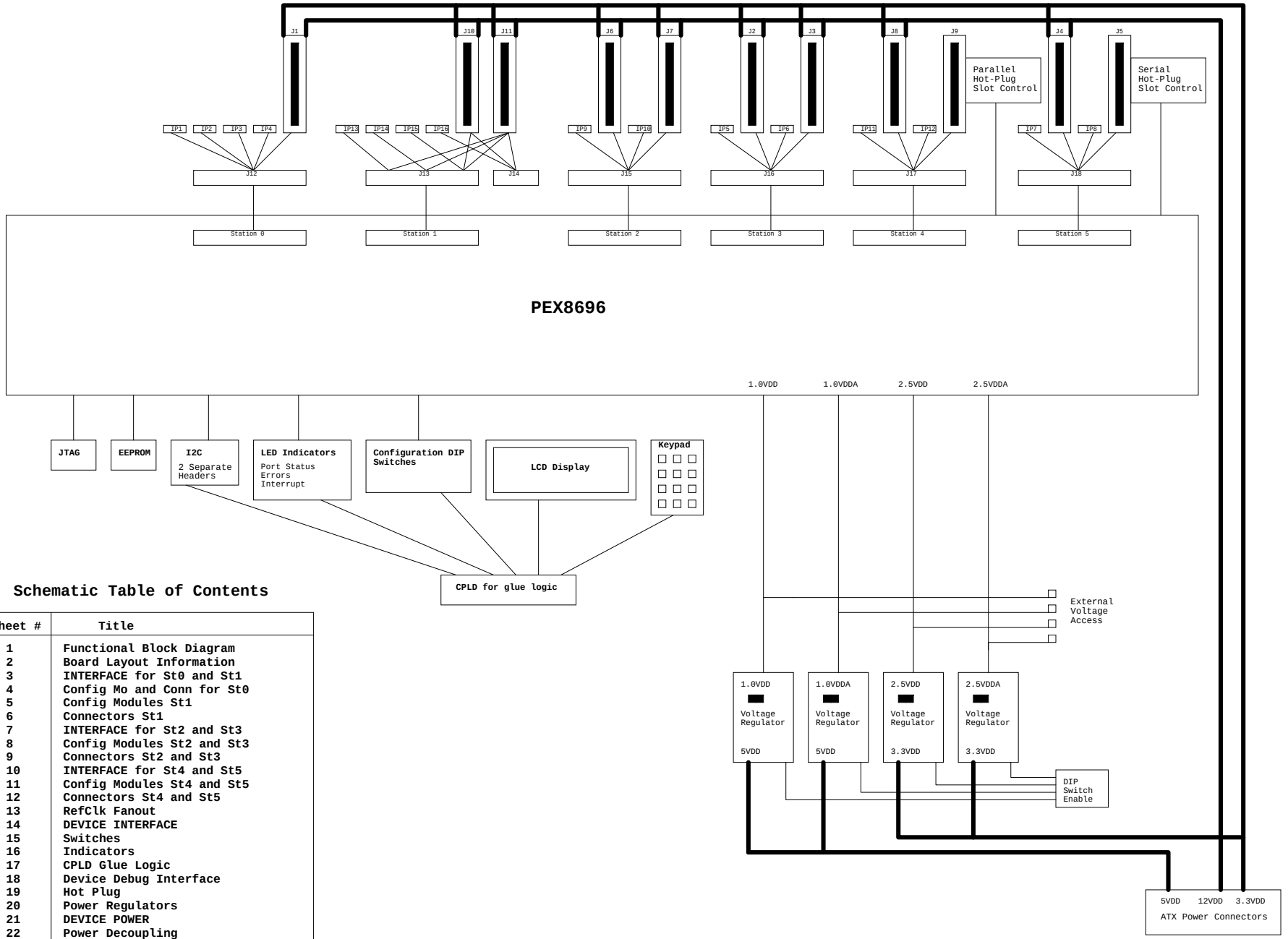
Item	Qty	Manufacturer	Manufacturer Part Number	Description	Package	Reference
16	6	FCI	74221	Header, BGA, 10x40, receptacle		J12,J13,J15,J16,J17,J18
17	1	FCI	84517-101LF	Header, BGA, 10x20, recept, Pb Free	84517	J14
18	9	Molex	47080-4001	CONNECTOR, SATA, right-angle		P1,P2,P3,P4,P5,P6,P7,P8,P9
19	4	International Rectifier	IRF7470	MOSFET, N-CHAN, 10A, Rds=13 mohm	SO8	Q1,Q2,Q3,Q4
20	19	CTS Resistor Products	742-083-512-J	RESNET, MF, 5.1 KOHM NIL 5%, ISOLATED	742-CTS-RN-8	RN2,RN3,RN4,RN5,RN6,RN9,RN10,RN11,RN12,RN13,RN14,RN15,RN16,RN17,RN18,RN19,RN20,RN21,RN22
21	12	Panasonic	ERJ-3EKF1431V	RES 1.43K OHM 1/10W 1% 0603 SMD	SMT, 0603	R1,R2,R3,R4,R8,R9,R10,R11,R16,R17,R18,R19
22	63	Panasonic	ERJ-3GEYJ512V	RES 5.1K OHM 1/10W 5% 0603 SMD	SMT, 0603	R5,R6,R7,R12,R13,R14,R15,R20,R21,R22,R23,R146,R164,R165,R166,R167,R168,R169,R170,R171,R172,R174,R175,R176,R177,R183,R187,R188,R193,R194,R195,R196,R198,R199,R200,R201,R202,R203,R204,R205,R213,R273,R274,R275,R287,R290,R295,R297,R299,R304,R305,R327,R328,R329,R330,R333,R334,R339,R346,R347,R359,R362,R363
23	8	Panasonic	ERJ-3GEYJ513V	RES 51K OHM 1/10W 5% 0603 SMD	SMT, 0603	R24,R25,R26,R27,R28,R29,R30,R63
24	20	Vishay/Dale	CRCW040273K2FKED	RES 73.2K OHM 1/16W 1% 0402 SMD	SMT, 0402	R31,R32,R33,R34,R35,R36,R37,R38,R39,R40,R41,R42,R43,R44,R45,R46,R47,R48,R49,R50
25	2	Vishay/Dale	CRCW04027K32FKED	RES 7.32K OHM 1/16W 1% 0402 SMD	SMT, 0402	R65,R70
26	24	Panasonic	ERJ-2RKF33R0X	RES 33.0 OHM 1/16W 1% 0402 SMD	SMT, 0402	R51,R52,R53,R54,R55,R56,R57,R58,R59,R60,R61,R62,R64,R66,R67,R68,R69,R71,R72,R73,R77,R78,R79,R80
27	22	Vishay/Dale	CRCW040210K0JNED	RES 10K OHM 1/16W 5% 0402 SMD	SMT, 0402	R76,R81,R102,R103,R104,R105,R106,R107,R108,R109,R110,R111,R123,R124,R125,R126,R127,R128,R138,R139,R140,R141
28	40	Panasonic	ERJ-2GEJ121X	RES 120 OHM 1/16W 5% 0402 SMD	SMT, 0402	R82,R83,R84,R85,R86,R87,R88,R89,R90,R91,R92,R93,R94,R95,R96,R97,R98,R99,R100,R101,R112,R113,R114,R115,R116,R117,R118,R119,R120,R121,R122,R129,R130,R131,R132,R133,R134,R135,R136,R137
29	4	Panasonic	ERJ-3GEYJ102V	RES 1.0K OHM 1/10W 5% 0603 SMD	SMT, 0603	R142,R143,R144,R145
30	6	Panasonic	ERJ-3GEYJ103V	RES 10K OHM 1/10W 5% 0603 SMD	SMT, 0603	R147,R149,R150,R151,R319,R320
31	1	Panasonic	ERJ-3GEYJ152V	RES 1.5K OHM 1/10W 5% 0603 SMD	SMT, 0603	R148
32	9	Yageo	9C06031A0R00JLHFT	RES, Shunt Select Footprint, 0603	SMT, 0603-2	R152,R153,R154,R155,R296,R300,R318,R321,R326
33	2	Panasonic	ERJ-3EKF2261V	RES 2.26K OHM 1/10W 1% 0603 SMD	SMT, 0603	R160,R161
34	5	Yageo	9C06031A0R00JLHFT	RES 0.0 OHM 1/10W 5% 0603 SMD	SMT, 0603	R162,R163,R298,R331,R332
35	1	Panasonic	ERJ-8GEYJ200V	RES 20 OHM 1/4W 5% 1206 SMD	SMT, 1206	R197

Item	Qty	Manufacturer	Manufacturer Part Number	Description	Package	Reference
36	45	Panasonic	ERJ-3GEYJ391V	RES 390 OHM 1/10W 5% 0603 SMD	SMT, 0603	R206,R207,R208,R209,R210,R211, R212,R214,R223,R224,R225,R226, R227,R228,R229,R230,R231,R232, R233,R234,R235,R236,R237,R238, R239,R240,R241,R242,R243,R244, R245,R246,R276,R277,R315,R316, R317,R340,R341,R353,R354,R357, R358,R369,R370
37	33	Panasonic	ERJ-3GEYJ511V	RES 510 OHM 1/10W 5% 0603 SMD	SMT, 0603	R215,R216,R217,R218,R219,R220, R221,R222,R247,R248,R249,R250, R251,R252,R253,R254,R255,R256, R257,R258,R259,R260,R261,R262, R263,R264,R265,R266,R267,R268, R269,R270,R272
38	6	Panasonic	ERJ-3GEYJ330V	RES, CF, 33 OHM, 1/10W, 5%, 0603 SMD	SMT, 0603	R271,R280,R283,R311,R314,R348
39	2	Panasonic	ERJ-3EKF2802V	RES 28.0K OHM 1/10W 1% 0603 SMD	SMT, 0603	R278,R309
40	2	Panasonic	ERJ-3EKF4991V	RES 4.99K OHM 1/10W 1% 0603 SMD	SMT, 0603	R279,R310
41	4	Panasonic	ERJ-3EKF3481V	RES 3.48K OHM 1/10W 1% 0603 SMD	SMT, 0603	R281,R282,R312,R313
42	1	Yageo	9C08052A0R00JLH FT	RES 0.0 OHM 1/8W 5% 0805 SMD	SMT, 0805	R284
43	4	Panasonic	ERJ-3EKF2001V	RES 2.00K OHM 1/10W 1% 0603 SMD	SMT, 0603	R285,R289,R323,R324
44	4	Panasonic	ERJ-1GEF33R2C	RES 33.2 OHM 1/20W 1% 0201 SMD	SMT, 0201	R286,R291,R301,R302
45	4	TTelectronics	LR2512-01-R020-F	Res. 2W, 0.02 ohm 1%	SMT, 2512	R288,R292,R322,R325
46	4	Panasonic	ERJ-1GEF49R9C	RES 49.9 OHM 1/20W 1% 0201 SMD	SMT, 0201	R293,R294,R306,R307
47	1	Panasonic	ERJ-3GEYJ512V	RES, Shunt Select Footprint, 0603	SMT, 0603-2	R303
48	1	Panasonic	ERJ-3EKF4750V	RES 475 OHM 1/16W 1% 0603 SMD	SMT, 0603	R308
49	3	Panasonic	ERJ-3EKF4001V	RES 4.00K OHM 1/10W 1% 0603 SMD	SMT, 0603	R335,R336,R342
50	5	Panasonic	ERJ-3EKF1001V	RES 1.00K OHM 1/10W 1% 0603 SMD	SMT, 0603	R337,R338,R343,R350,R365
51	2	Panasonic	ERJ-3EKF6811V	RES 6.81K OHM 1/10W 1% 0603 SMD	SMT, 0603	R344,R360
52	2	Panasonic	ERJ-3EKF1432V	RES 14.3K OHM 1/10W 1% 0603 SMD	SMT, 0603	R345,R361
53	2	Panasonic	ERJ-3EKF1501V	RES 1.50K OHM 1/10W 1% 0603 SMD	SMT, 0603	R349,R364
54	2	Panasonic	ERJ-3EKF1212V	RES 12.1K OHM 1/10W 1% 0603 SMD	SMT, 0603	R351,R367
55	2	Panasonic	ERJ-3EKF4531V	RES 4.53K OHM 1/10W 1% 0603 SMD	SMT, 0603	R352,R368
56	2	Panasonic	ERJ-3GEYJ823V	RES 82K OHM 1/10W 5% 0603 SMD	SMT, 0603	R355,R371
57	1	Vishay/Dale	CRCW251213R0JN EG	RES 13 OHM 1W 5% 2512 SMD	SMT, 2512	R374
58	1	IRC	PWC2512-20R0-F	RES 20 OHM 1.5W 1% 2512 SMD	SMT, 2512	R375
59	3	Panasonic	ERJ-A1AJ131U	RES WIDE TERM 130 OHM 5% 2512	SMT, 2512	R376,R377,R378

Item	Qty	Manufacturer	Manufacturer Part Number	Description	Package	Reference
60	1	C & K	TDA06H0SB1	SWITCH DIP 6POS HALF PITCH SMD		SW4
61	3	C & K	TDA04H0SB1	SWITCH DIP 4POS HALF PITCH SMD		SW11,SW20,SW22
62	2	C & K	TDA08H0SB1	SWITCH DIP 8POS HALF PITCH SMD		SW13,SW23
63	2	C & K	TDA02H0SB1	SWITCH DIP 2POS HALF PITCH SMD		SW16,SW17
64	3	Omron	B3S-1002	SWITCH TACT 6MM SMD MOM 230GF		SW18,SW19,SW21
65	1	C & K	TDA10H0SB1	SWITCH DIP 10POS HALF PITCH SMD		SW24
66	1	PLX	PEX8696-AA50BC F	IC, PCI Express Switch, Gen 2, 96 Lane	FCBGA676	U1
67	8	Fairchild	NC7SZ126	IC, BUFFER, 24mA	SC70-5	U2,U3,U4,U5,U6,U7,U8,U10
68	1	On Semiconductor	NB100LVEP221FA G	IC, 1:20 Differential HSTL/ECL/PECL Clock Driver	LQFP-52	U9
69	1	Mill-Max	210-93-308-41-001000	Socket, EEPROM, DIP8, Thru-hole	DIP8	U11
70	1	Lattice	LC5256MV-75FN256C	IC, CPLD		U14
71	3	On Semiconductor	MC74LCX541DTG	IC, Octal buffer, Flow-through pinout, OE, 24mA	TSSOP20	U15,U16,U18
72	1	Ecliptek	EMK23G2H-1.000M	Osc, 1.000MHz, 3.3V, 100ppm	EMK23	U17
73	1	Maxim	MAX6412UK29-T	IC, Reset controller, 2.9V threshold, Adj. reset timeout	SOT23-5	U19
74	1	TI	SN74CB3Q16210D GGR	IC, Bus Switch, 20-Bit	TSSOP48	U20
75	1	Fairchild	NC7SZ00P5X	IC, NAND Gate, Tpd=15nsec, 24mA	SC70-5	U21
76	2	TI	TPS2311IPW	IC, DUAL HOT SWAP CONTROLLER	TSSOP20	U22,U24
77	1	SpectraLinear	CY28400OXC-2	IC, 1:4 100MHz Differential Clock Fanout	SSOP28	U23
78	1	Maxim	MAX7311AUG	IC, 2-WIRE, 16-BIT IO EXPANDER	TSSOP24	U25
79	3	Maxim	MAX8556ETE	IC, V-REG, 4 A, ADJ, Enable, POK	Thin QFN16	U26,U27,U28
80	2	Intersil	ISL6132IR	IC, MULTI-VOLTAGE SUPERVISOR	L24.4x4	U29,U31
81	1	Belfuse	SRBC-16F2A0	IC, Non-iso DC/DC converter, 5V-to-1V @ 16A		U30
82	1	Belfuse	SRBC-10F2A0	IC, Non-iso DC/DC converter, 5V-to-1V @ 10A		U32
THROUGH HOLE COMPONENTS						
100	4	Vishay	94SP187X0016EBP	CAP, Oscon, 180uF, 16V	E case	C289,C290,C294,C295
101	1	3M	929400-01-36	HEADER, NVM Programming, 1x4 VERTICAL, .1in THRU-HOLE	SIP4	JP1

Item	Qty	Manufacturer	Manufacturer Part Number	Description	Package	Reference
102	1	Amp	103308-1	CONN HEADER LOPRO STR 10POS 15AU	0.1" 2x5	JP2
103	1	Amp	103308-1	CONN HEADER LOPRO STR 10POS 15AU	0.1" 2x5	JP3
104	1	3M	929710-10-02	CONN HEADER .100 DUAL STR 4POS	0.1" 2x2	JP5
105	1	3M	929710-10-08	CONN HEADER .100 DUAL STR 16POS	0.1" 2x8	JP6
106	1	3M	929400-01-36	HEADER, Lattice Programming, 1x8 VERTICAL, .1in THRU-HOLE		JP7
107	1	3M	929710-10-05	CONN HEADER .100 DUAL STR 10POS	0.1" 2x5	JP8
108	11	Molex	87715-3302	PCI Express x16 Through-hole connector	TH, 164-pin	J1,J2,J3,J4,J5,J6,J7,J8,J9,J10,J11
109	2	On Shore Technology	OSTTA054163	TERM BLOCK 5.08MM VERT 5POS PCB		J25,J26
110	2	On Shore Technology	OSTTA024163	TERM BLOCK 5.08MM VERT 2POS PCB		J27,J28
111	1	Molex	39-29-9202	Header, ATX, 20 position, ST dual-row	ATX20_ST	P10
112	6	Molex	15-24-4449	Header, HD 4-pin, straight		P11,P12,P13,P14,P15,P16
113	1	Bourns	3352E-1-103LF	RES, VAR, 10K OHM THUMBWHEEL CERM, TH, TOP ADJ		RV3
114	6	Grayhill	78B02ST	SWITCH DIP EXTENDED SEALED 2POS TH	DIP4	SW2,SW3,SW6,SW7,SW9,SW10
115	2	Grayhill	78B03ST	SWITCH DIP TOP SLIDE EXT 3POS	DIP6	SW5,SW8
116	1	Grayhill	78B05ST	SWITCH DIP EXTENDED SEALED 5POS TH	DIP10	SW12
117	1	Grayhill	78B06ST	SWITCH DIP TOP SLIDE EXT 6POS	DIP12	SW14
118	1	Grayhill	88AC2	Keyboard, 3x4, Telephone		SW15
119	1	Mill-Max	210-93-308-41-001000	Socket, EEPROM, DIP8, Thru-hole	DIP8	U11
120	4	Components Corporation	TP-101-10-T			TP1,TP2,TP3,TP4
121	1	Crystalfontz	CFAH4004A	LCD Module, 40x4 character		U13
MANUALLY INSERTED COMPONENTS						
200	1	Atmel	AT25128A-10PU-1.8	IC SRL EE 128K 1.8V 8DIP	DIP8	U11
201	2	PLX Technology	91-0091-00-A	CONFIGURATION MODULE, x8x8	BGA10x40	J15,J16
202	2	PLX Technology	91-0092-00-A	CONFIGURATION MODULE, x8x4x4	BGA10x40	J17,J18
203	1	PLX Technology	91-0090-00-A	CONFIGURATION MODULE, x16	BGA10x40	J12
204	1	PLX Technology	91-0109-00-A	CONFIGURATION MODULE, 10x20	BGA10x20	J14

Item	Qty	Manufacturer	Manufacturer Part Number	Description	Package	Reference
205	1	PLX Technology	91-0125-00-A	CONFIGURATION MODULE, Cygnus125	BGA10x40	J13
MISCELLANEOUS COMPONENTS						
300	1	PLX Technology	90-0118-000-A	PCIe 96 LANE SWITCH RDK PCB, BASEBOARD, GEN2, Rev 000		
301	1	Advanced Thermal Solutions	ATS-54350W-C2-R0	HEAT SINK 35MM X 35MM X 24.5MM		U1
302	1	PLX Technology	91-0083-001-A	RDK x16 Cable Adapter		
PARTS THAT SHOULD NOT BE ASSEMBLED						
400	2	Panasonic	ERJ-3GEYJ433V	RES 43K OHM 1/10W 5% 0603 SMD	SMT, 0603	R356,R372
401	2	Panasonic	ERJ-3GEYJ512V	RES 5.1K OHM 1/10W 5% 0603 SMD	SMT, 0603	R156,R157
402	2	Bourns	3269W-1-254LF	TRIMPOT 250K OHM 6MM CERMET SMD, TOP ADJ, 12		RV1,RV2
403	1	CTS Resistor Products	742-083-512-J	RESNET, MF, 5.1 KOHM NIL 5%, ISOLATED	742-CTS-RN-8	RN1
404	4	Kemet	C0603C104K4RACTU	CAP .10UF 16V CERAMIC X7R 0603	SMT, 0603	C270,C271,C277,C278
405	1	3M	929400-01-36	HEADER, 1x2 VERTICAL, .1in THRU-HOLE	SIP-2	JP14
406	1	C & K	TDA06H0SB1	SWITCH DIP 6POS HALF PITCH SMD		SW1
407	1	Maxim	MAX6658	IC, Temperature Sensor, SMBus-Compatible, SO8	SO8	U12
408	1	3M	929710-10-02	CONN HEADER .100 DUAL STR 4POS	0.1" 2x2	JP4
409	2	Panasonic	ERJ-3EKF2261V	RES 2.26K OHM 1/10W 1% 0603 SMD	SMT, 0603	R158,R159
410	1	Kemet	C0402C104K8PACTU	CAP .10UF 10V CERAMIC X5R 0402	SMT, 0402	C249



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Revision History

Rev. #	Date	Reason for Revision
000	September 26, 2008	First board build
001	July 6, 2009	Thermal diode not supported

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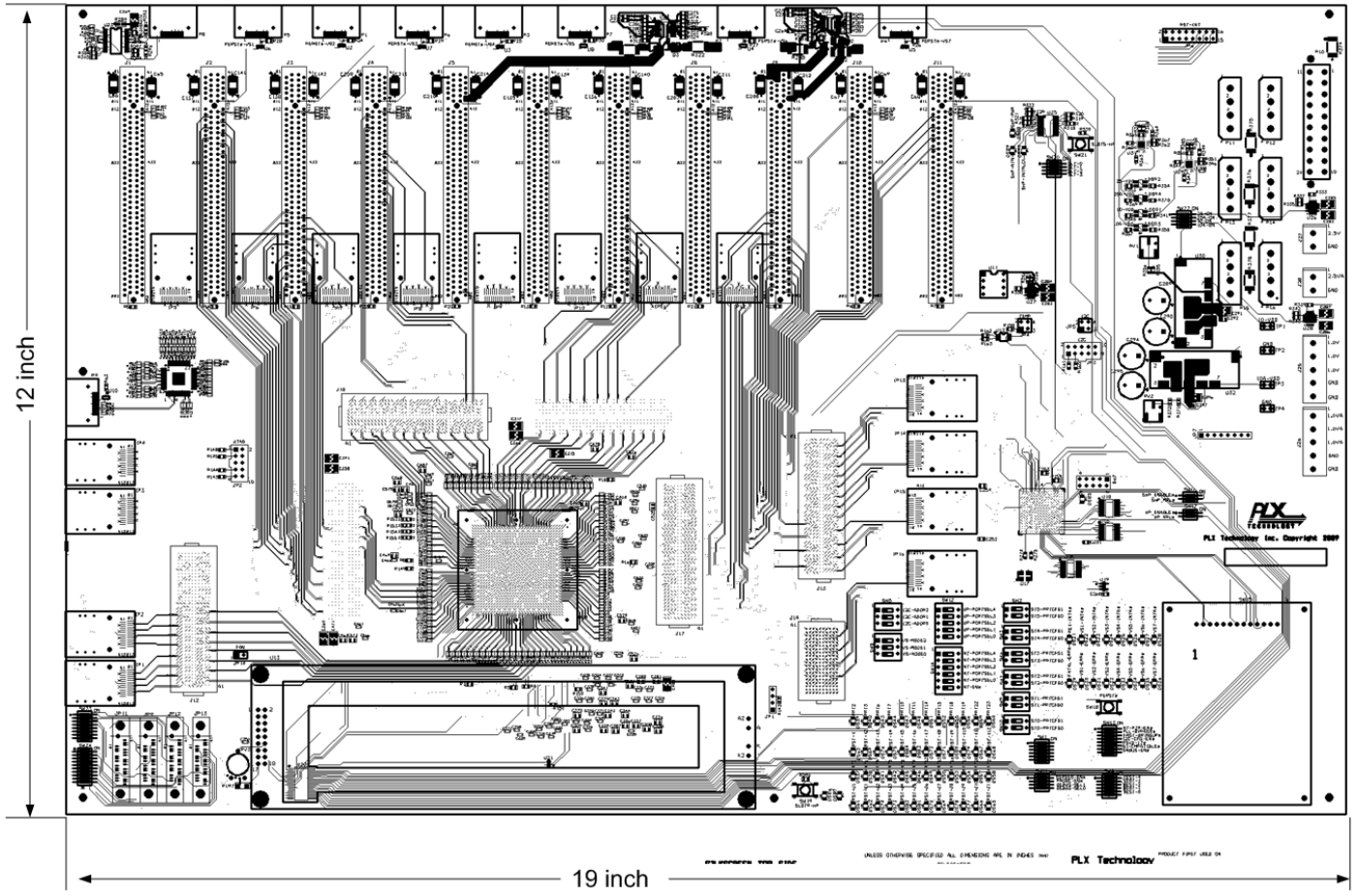
Title	PEX8696 RDK BOARD - Functional Block Diagram	
Size C	Document Number 91-0118-001-A	Rev 001
Date: Monday, July 13, 2009	Sheet 1 of 22	

Board Thickness	= 63 mils

LAYER STACKUP

	SOLDERMASK, 0.8 mil
L1, SIGNAL 1, 2.0 mil	
	PREPREG, Er=3.9, 2.9 mil
L2, GND1, 0.6 mil	
	CORE, Er=4.2, 6.0 mil
L3, SIGNAL 2, 0.6 mil	
	PREPREG, Er=4.1, 4.2 mil
L4, POWER1, 0.6 mil	
	CORE, Er=4.2, 6.0 mil
L5, SIGNAL 3, 0.6 mil	
	PREPREG, Er=4.1, 4.0 mil
L6, POWER2, 1.2 mil	
	CORE, Er=4.3, 3.0 mil
L7, GND2, 1.2 mil	
	PREPREG, Er=4.1, 4.0 mil
L8, SIGNAL 4, 0.6 mil	
	CORE, Er=4.2, 6.0 mil
L9, POWER3, 0.6 mil	
	PREPREG, Er=4.1, 4.2 mil
L10, SIGNAL 5, 0.6 mil	
	CORE, Er=4.2, 6.0 mil
L11, GND3, 0.6 mil	
	PREPREG, Er=3.9, 2.9 mil
L12, SIGNAL 6, 2.0 mil	
	SOLDERMASK, 0.8 mil



OUTER DIFF PAIR TRACES

WIDTH = 5.0 mils
SPACING = 8.0 mils
Cu = 1.50 oz
DIFF Trace Zo = 85 ohm

INNER DIFF PAIR TRACES

WIDTH = 4.0 mils
SPACING = 4.0 mils
Cu = 0.50 oz
DIFF Trace Zo = 85 ohm

NL = No Load

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Title	PEX8696 RDK BOARD - Board Layout Information	
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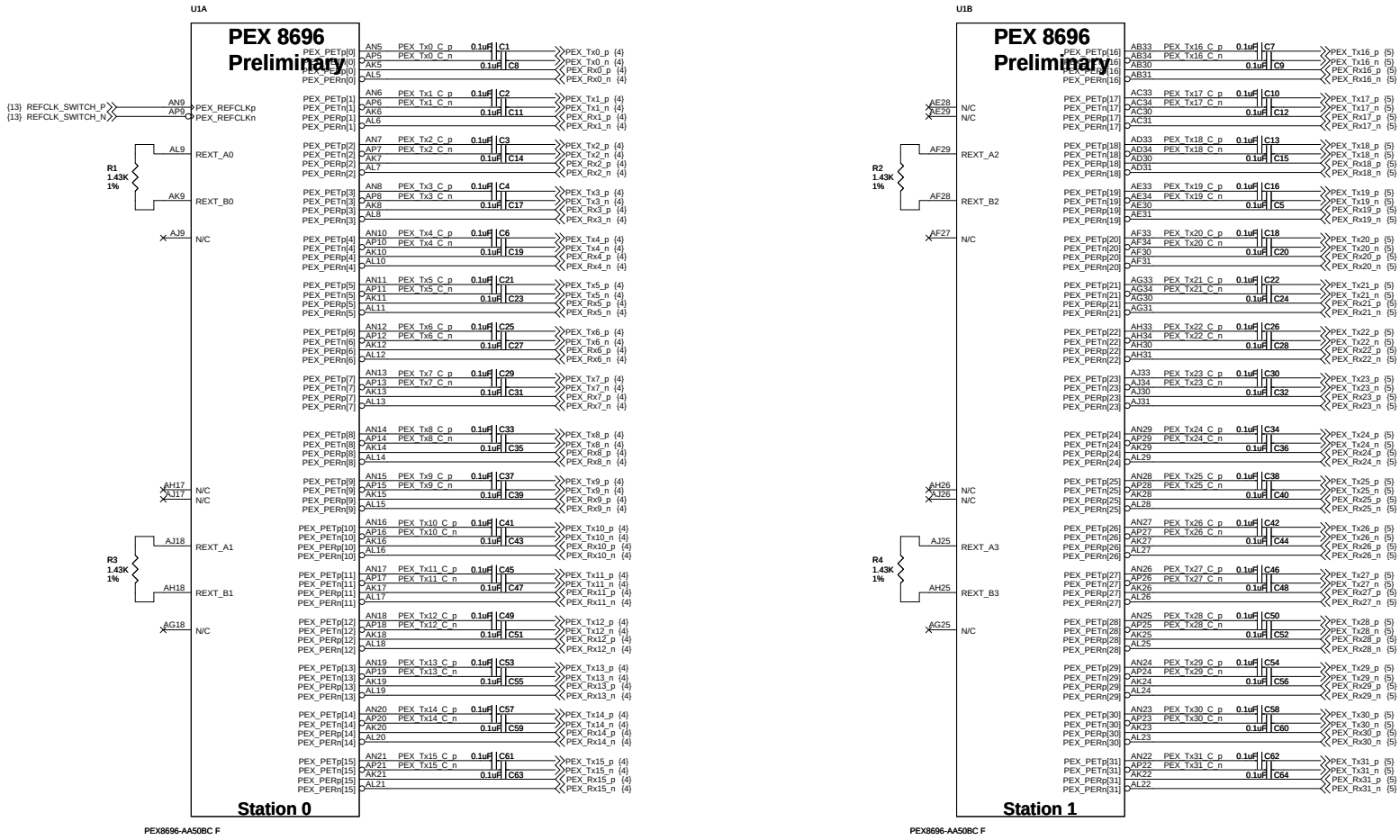

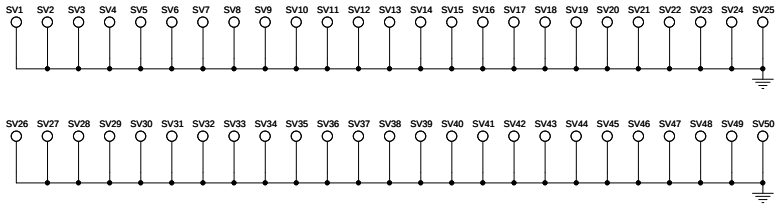

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Title: PEX8696 RDK BOARD - Station 0 and Station 1 Interfaces		
Size: C	Document Number: 91-0118-001-A	Rev: 001
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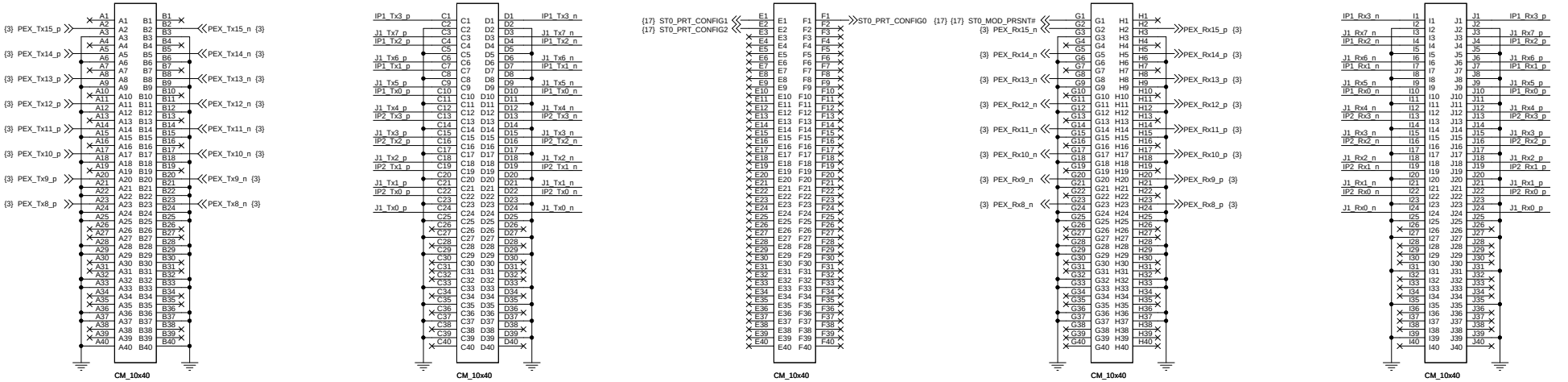
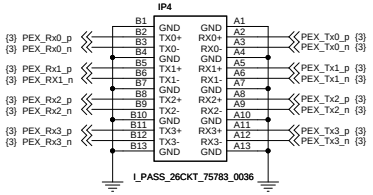
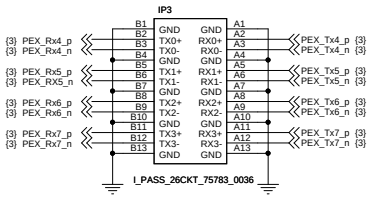
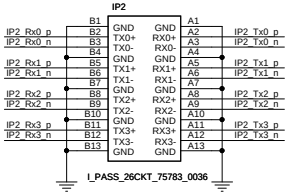
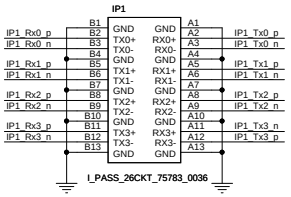
10x40 CONFIGURATION MODULE

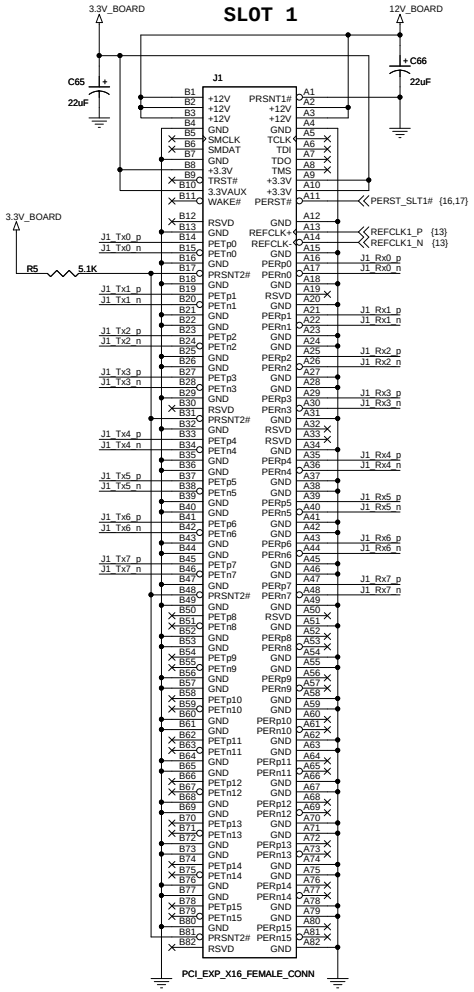












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Title	PEX8696 RDK BOARD - Station 0 Configuration Module and Connectors	
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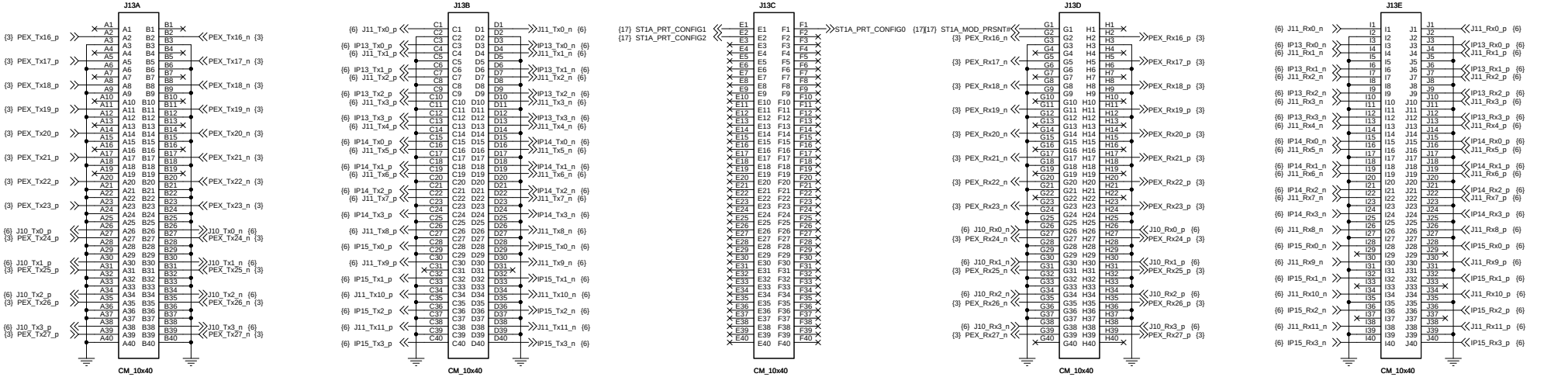
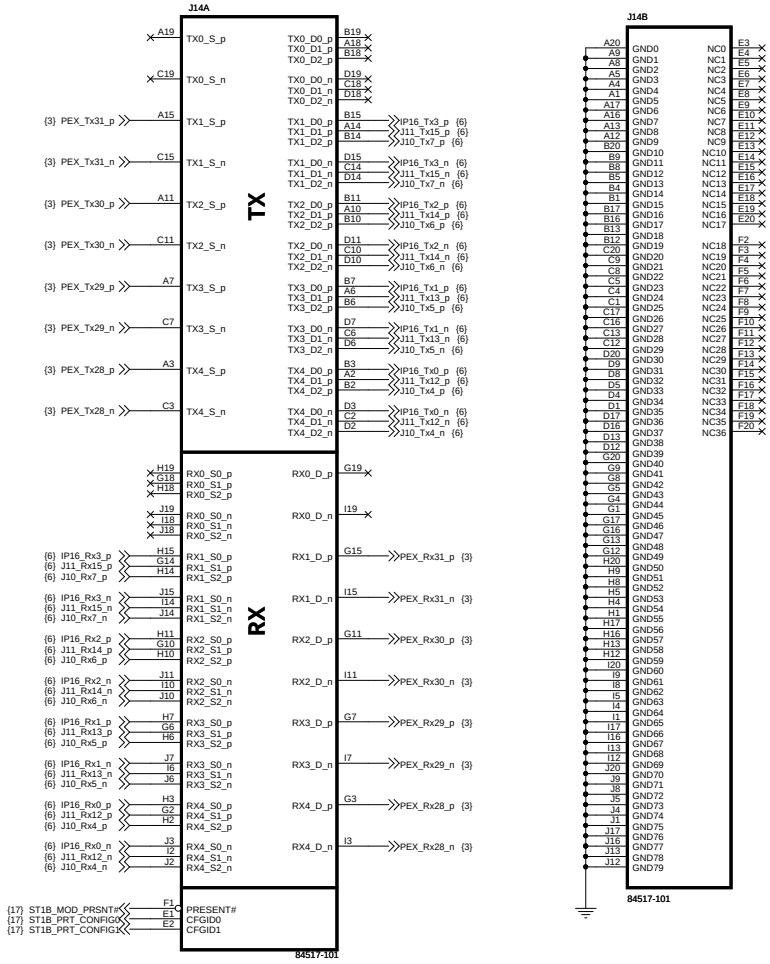
10x40 CONFIGURATION MODULE



10x20 CONFIGURATION MODULE



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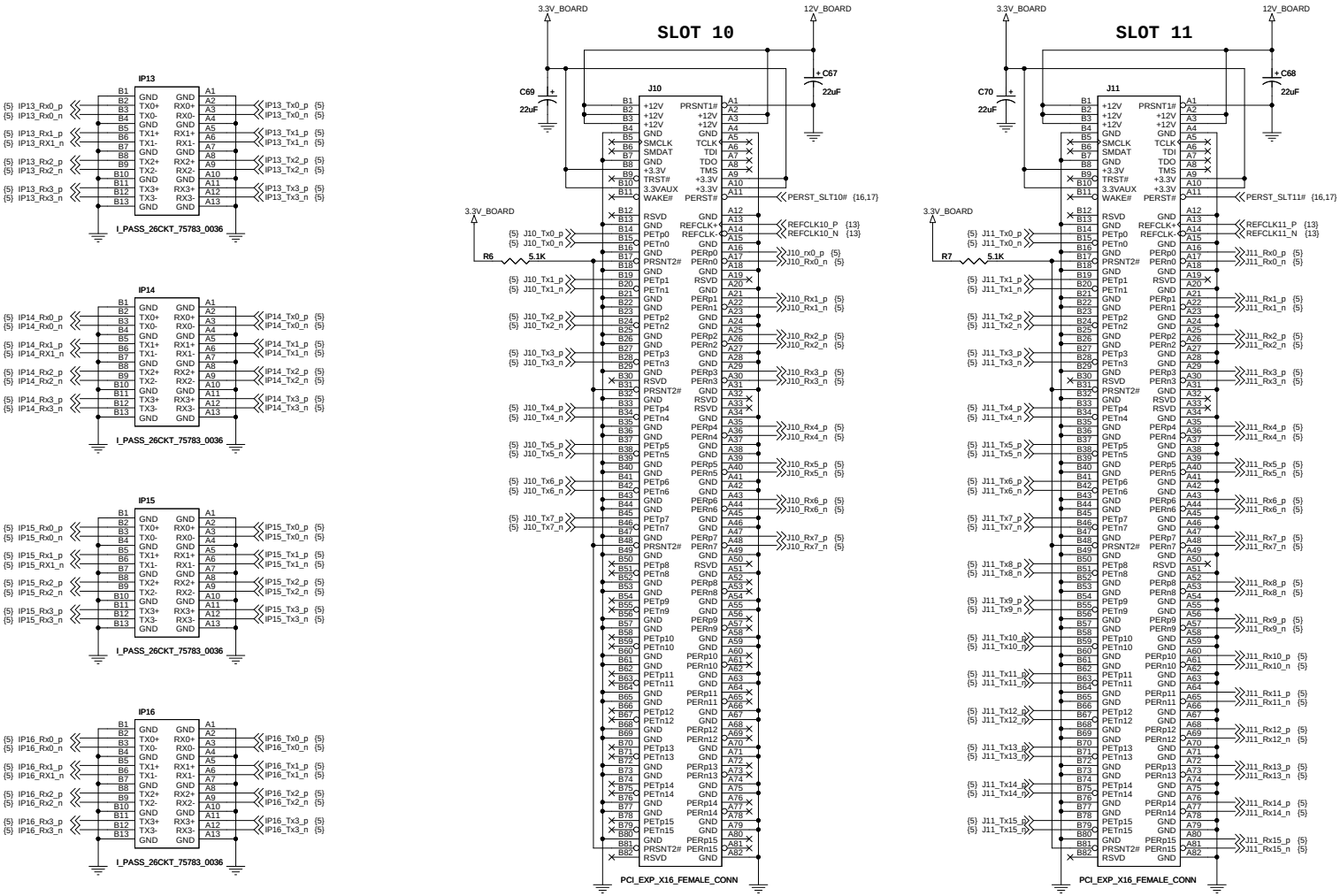

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Title	PEX8696 RDK BOARD - Station 1 Connectors	
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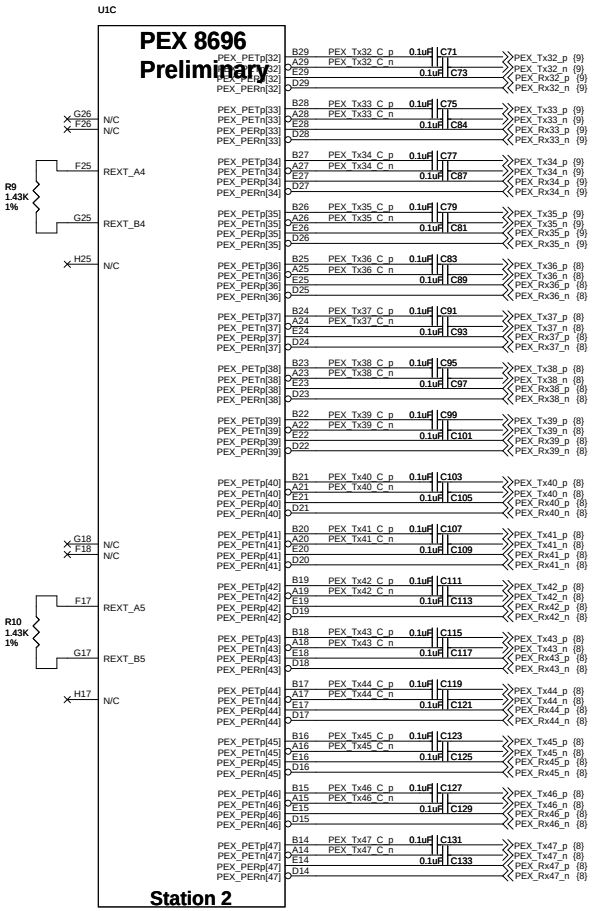

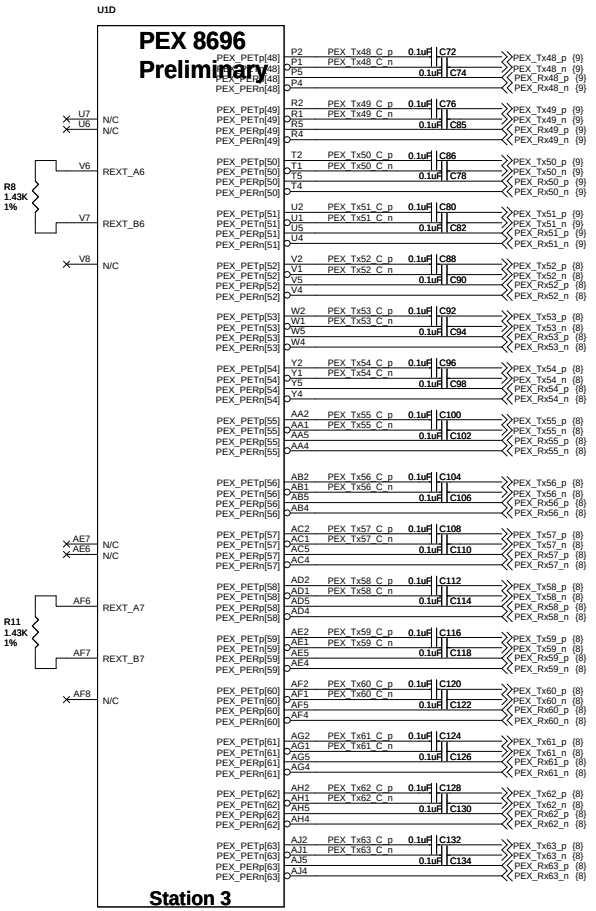

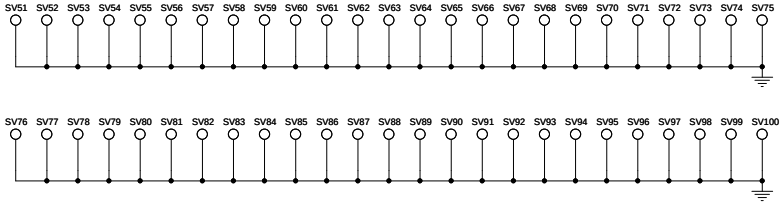

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Title: PEX8696 RDK BOARD - Station 2 and Station 3 Interfaces		
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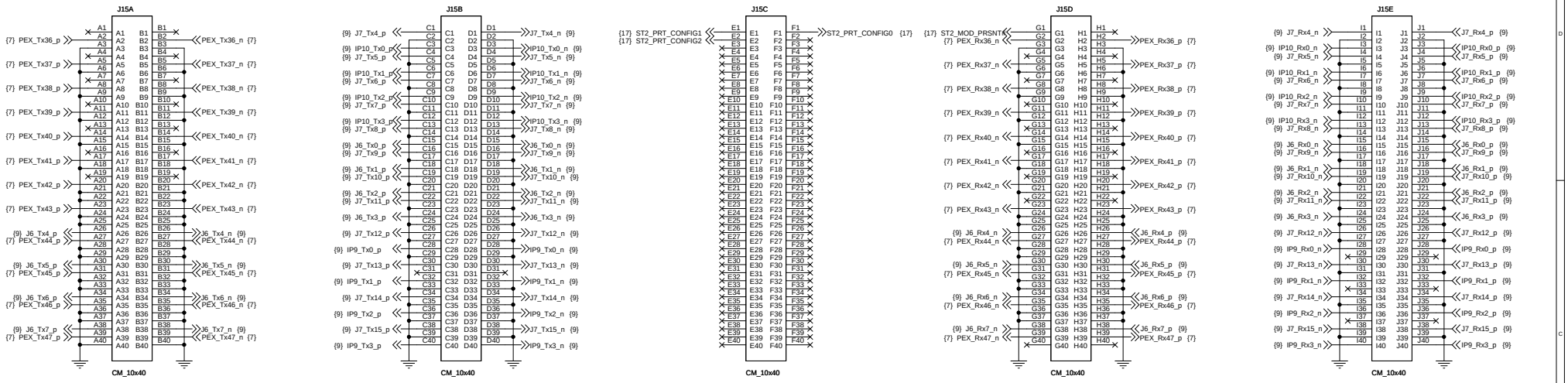
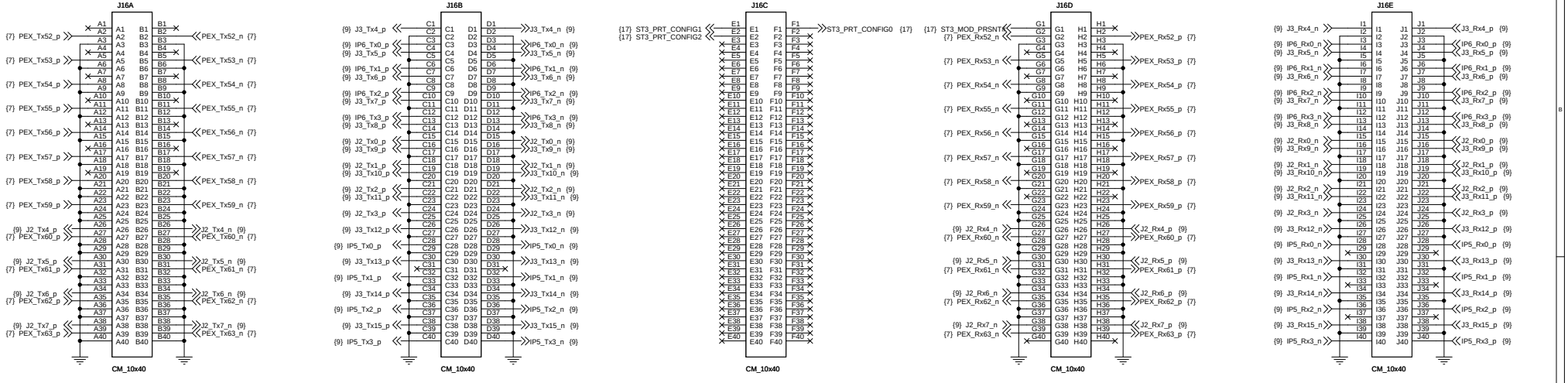
STATION 2 CONFIGURATION MODULE



STATION 3 CONFIGURATION MODULE



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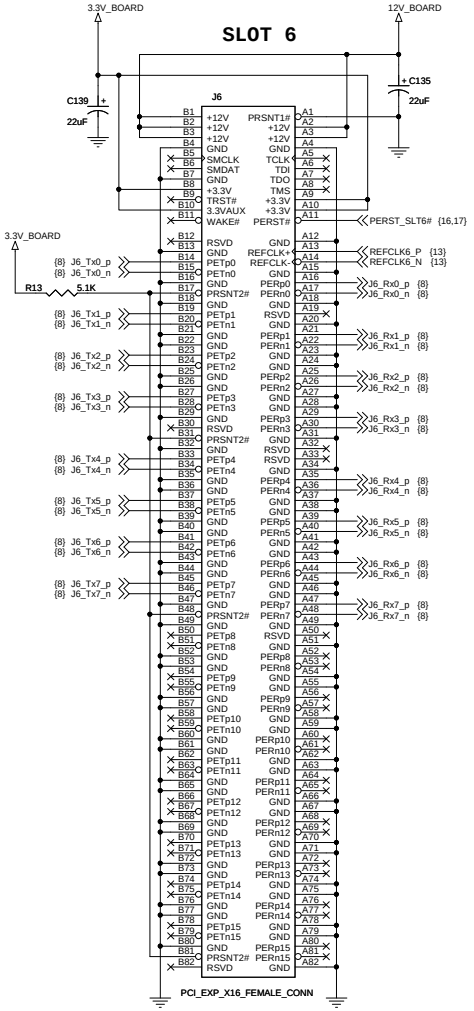
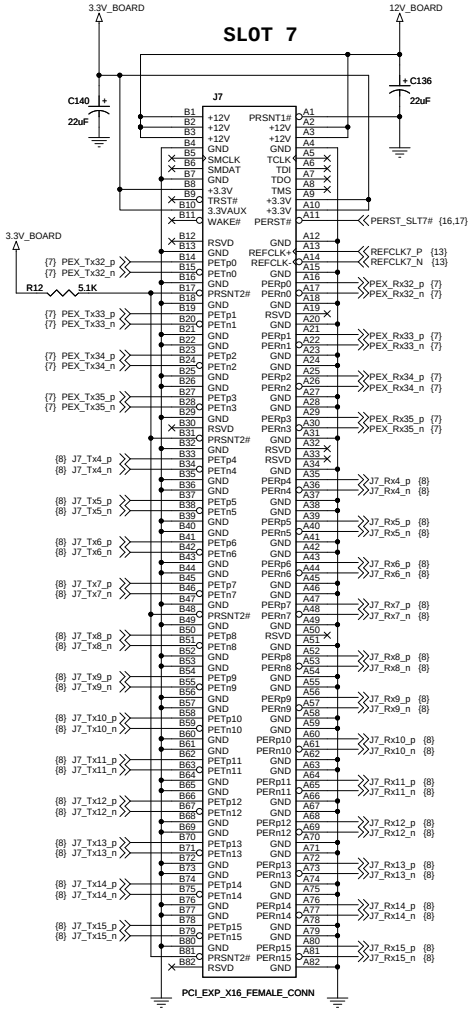
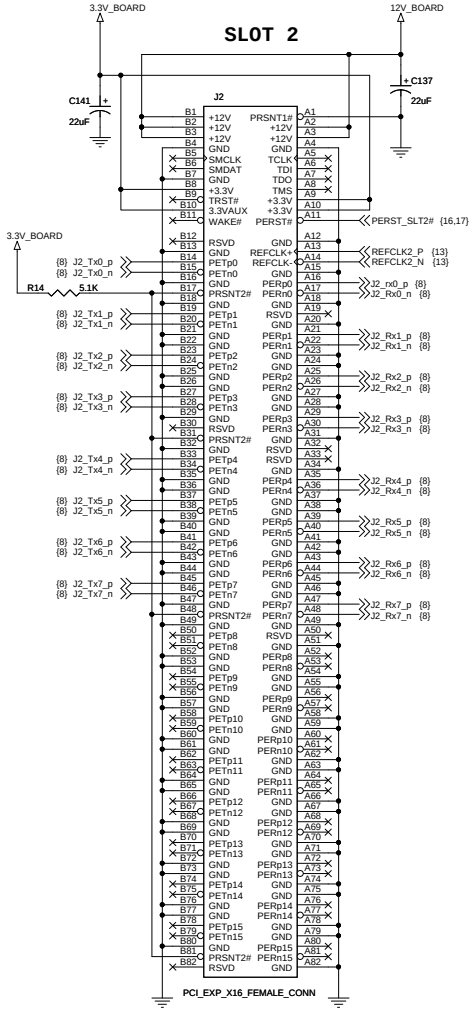
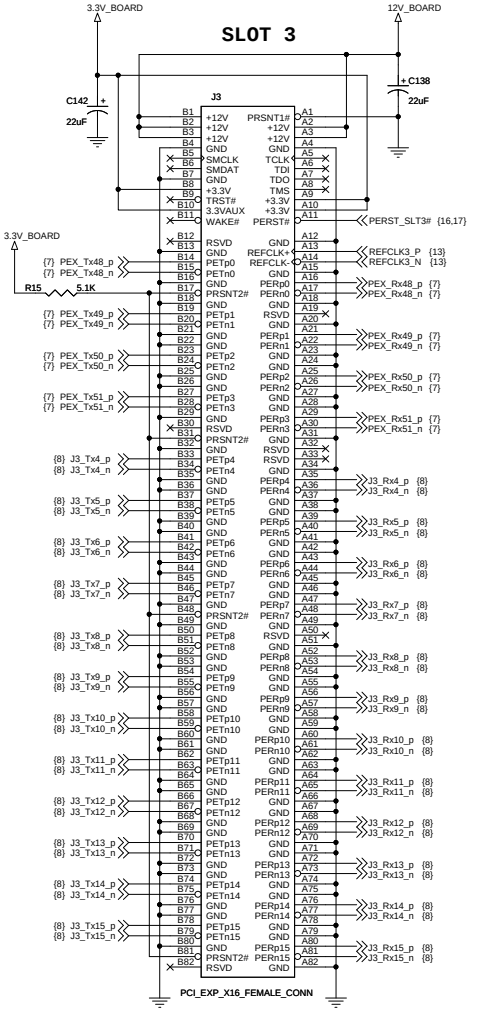
STATION 2 CONNECTORS

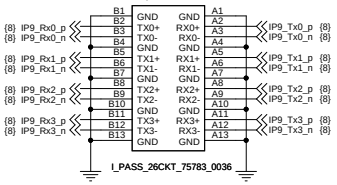


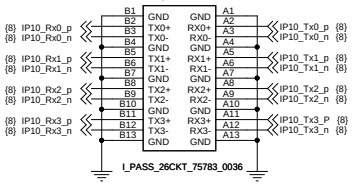


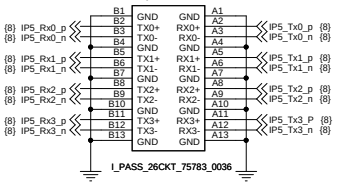
STATION 3 CONNECTORS

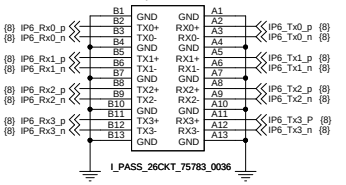












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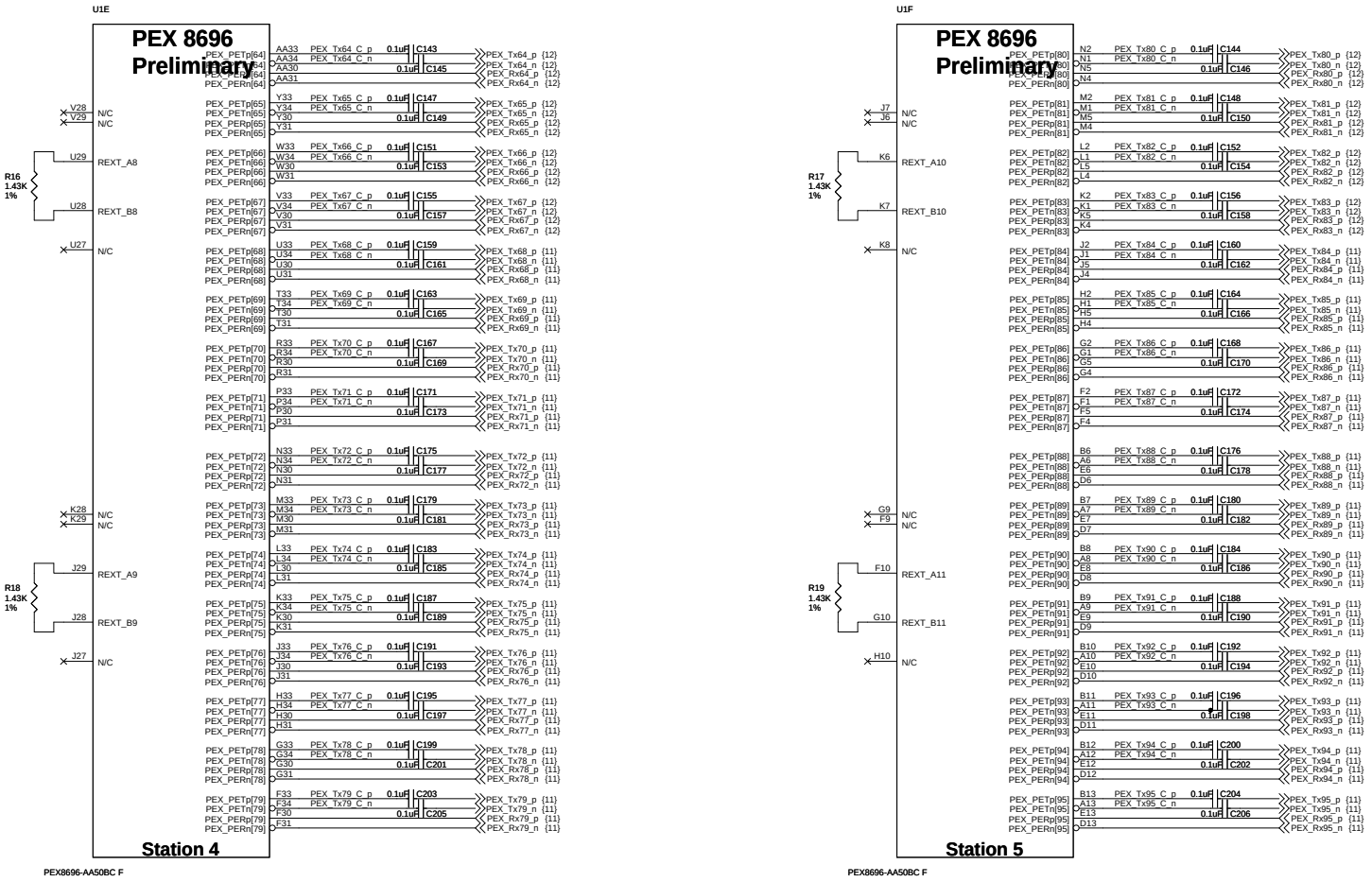

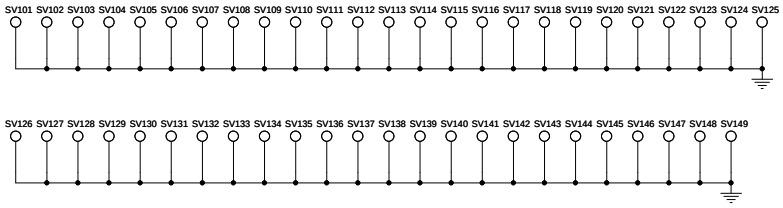

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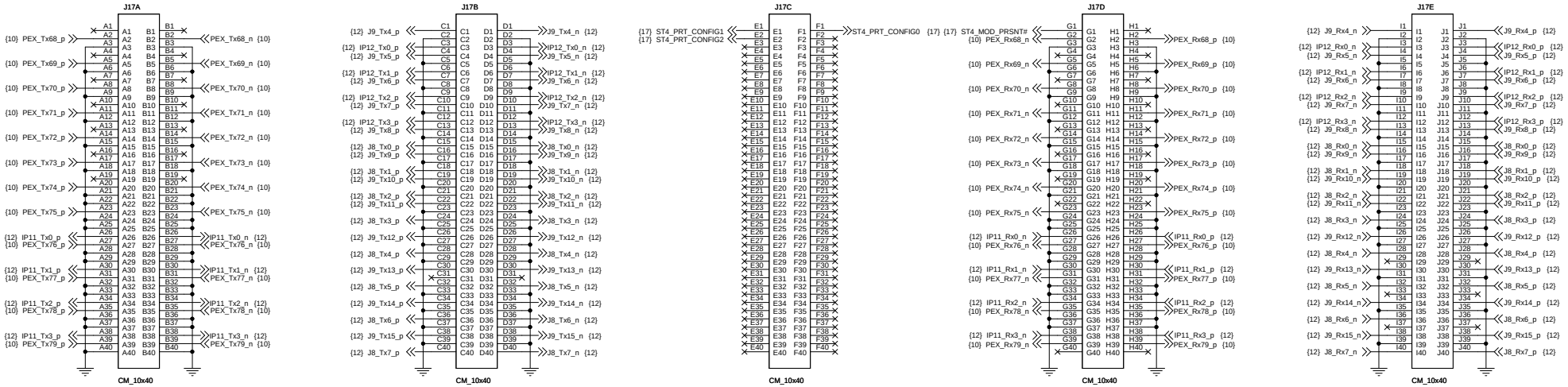
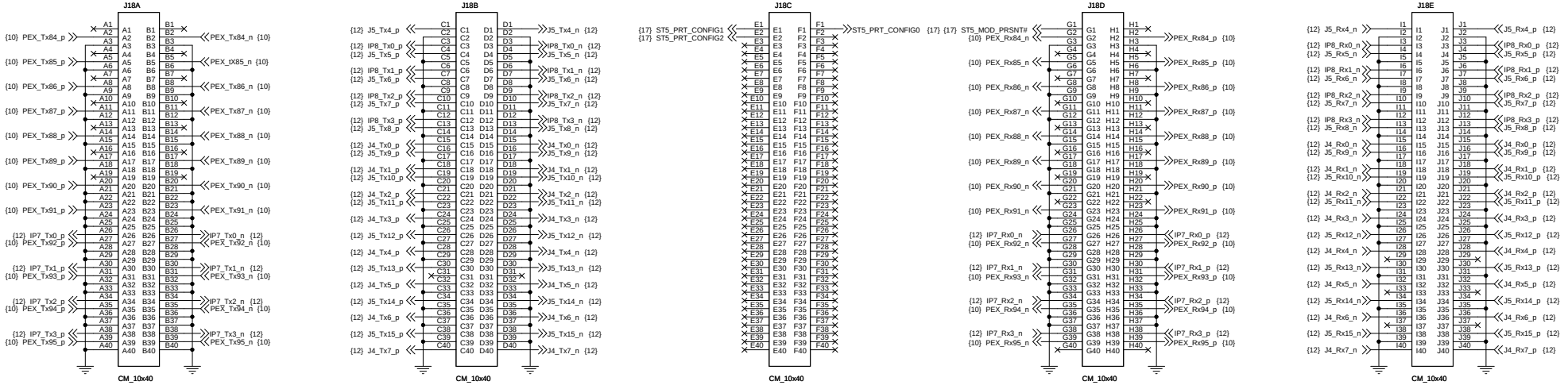
STATION 4 CONFIGURATION MODULE



STATION 5 CONFIGURATION MODULE



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PEX8696 RDK BOARD - Station 4 and Station 5 Configuration Modules

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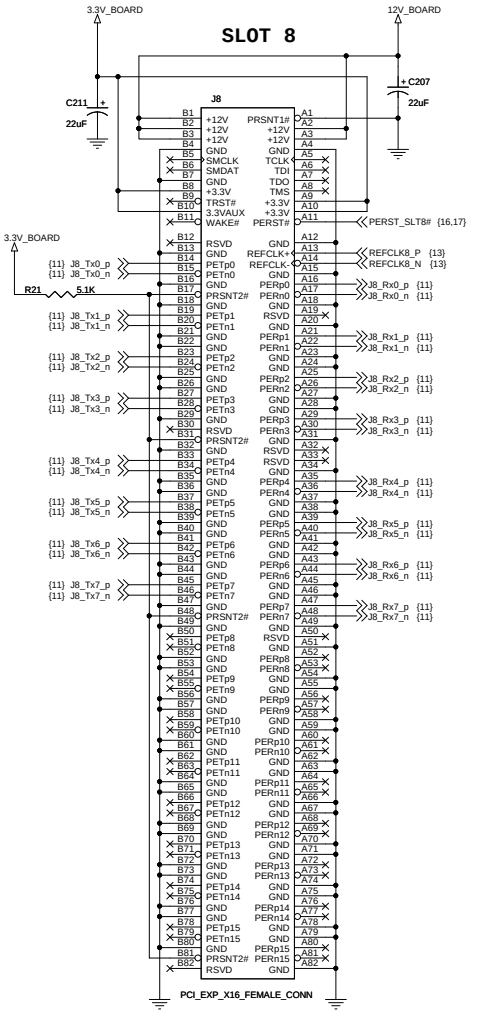
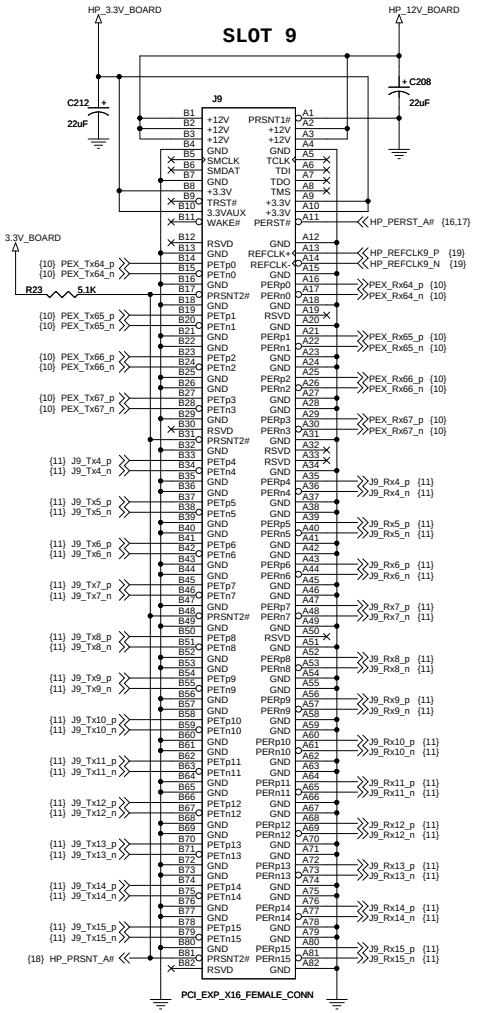
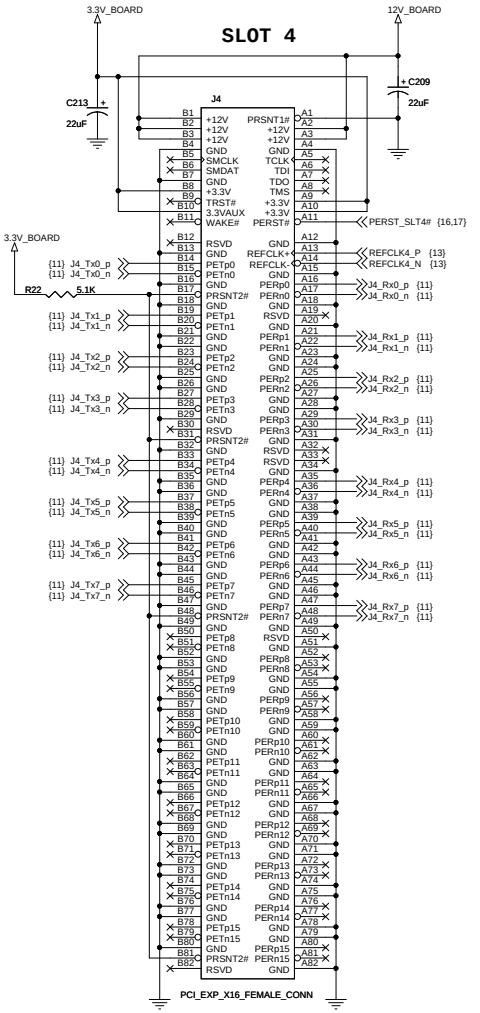
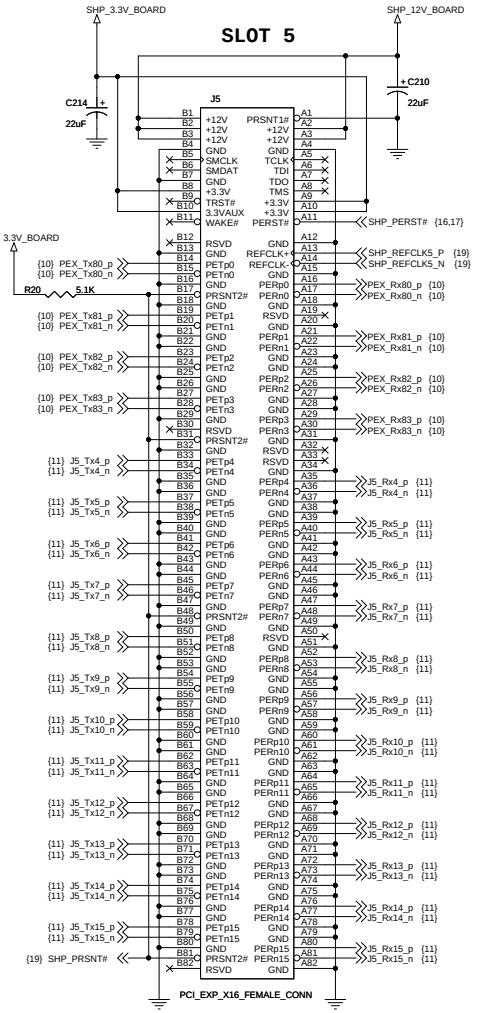
STATION 4 CONNECTORS

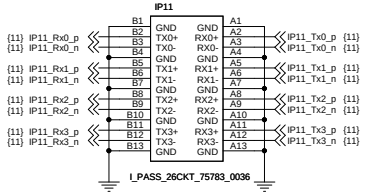


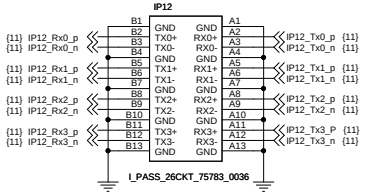


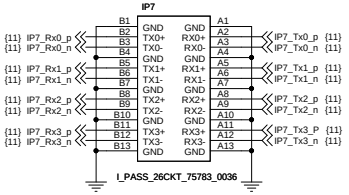
STATION 5 CONNECTORS

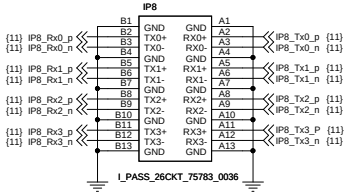












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Title	PEX8696 RDK BOARD - Station 4 and Station 5 Connectors	
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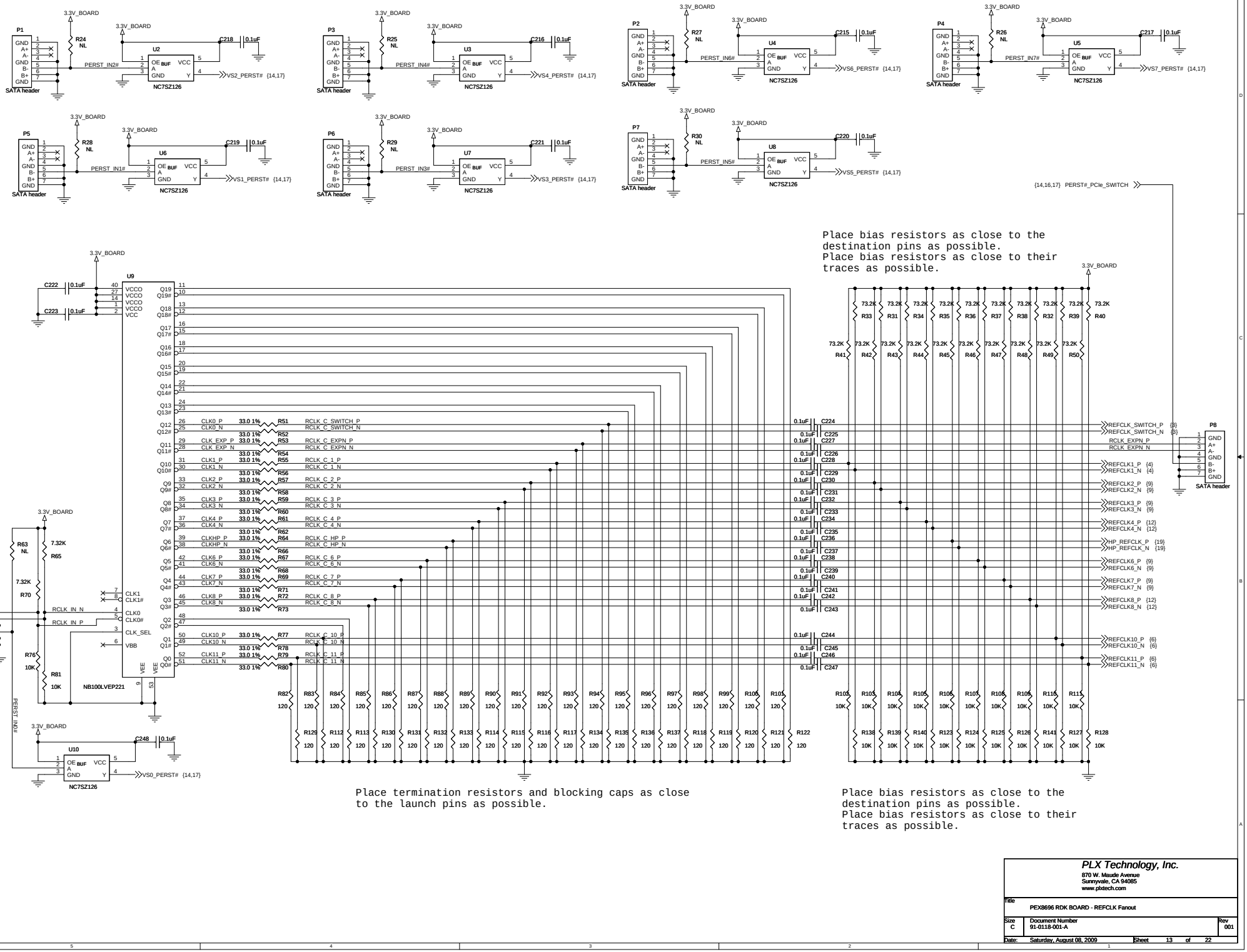
P1
P2
P3
P4
P5
P6
P7
P8
P9
SATA header
3.3V_BOARD
R24 NL
R25 NL
R26 NL
R27 NL
R28 NL
R29 NL
R30 NL
R63 NL
U2
U3
U4
U5
U6
U7
U8
U9
U10
NC7SZ126
C218 0.1uF
C216 0.1uF
C215 0.1uF
C217 0.1uF
C219 0.1uF
C221 0.1uF
C220 0.1uF
C222 0.1uF
C223 0.1uF
C248 0.1uF
PERST_IN2#
PERST_IN4#
PERST_IN6#
PERST_IN7#
PERST_IN1#
PERST_IN5#
VS2_PERST# {14,17}
VS4_PERST# {14,17}
VS6_PERST# {14,17}
VS7_PERST# {14,17}
VS1_PERST# {14,17}
VS3_PERST# {14,17}
VS5_PERST# {14,17}
VS0_PERST# {14,17}
{14,16,17} PERST#_PCIe_SWITCH
NB100LVEP221
R65 7.32K
R70 7.32K
R76 10K
R81 10K
RCLK_IN_N
RCLK_IN_P
CLK_SEL
CLK1
CLK1#
CLK0
CLK0#
VBB
VEE
Place bias resistors as close to the destination pins as possible.
Place bias resistors as close to their traces as possible.
Place termination resistors and blocking caps as close to the launch pins as possible.
Place bias resistors as close to the destination pins as possible.
Place bias resistors as close to their traces as possible.
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Title
PEX8696 RDK BOARD - REFCLK Fanout
Size C
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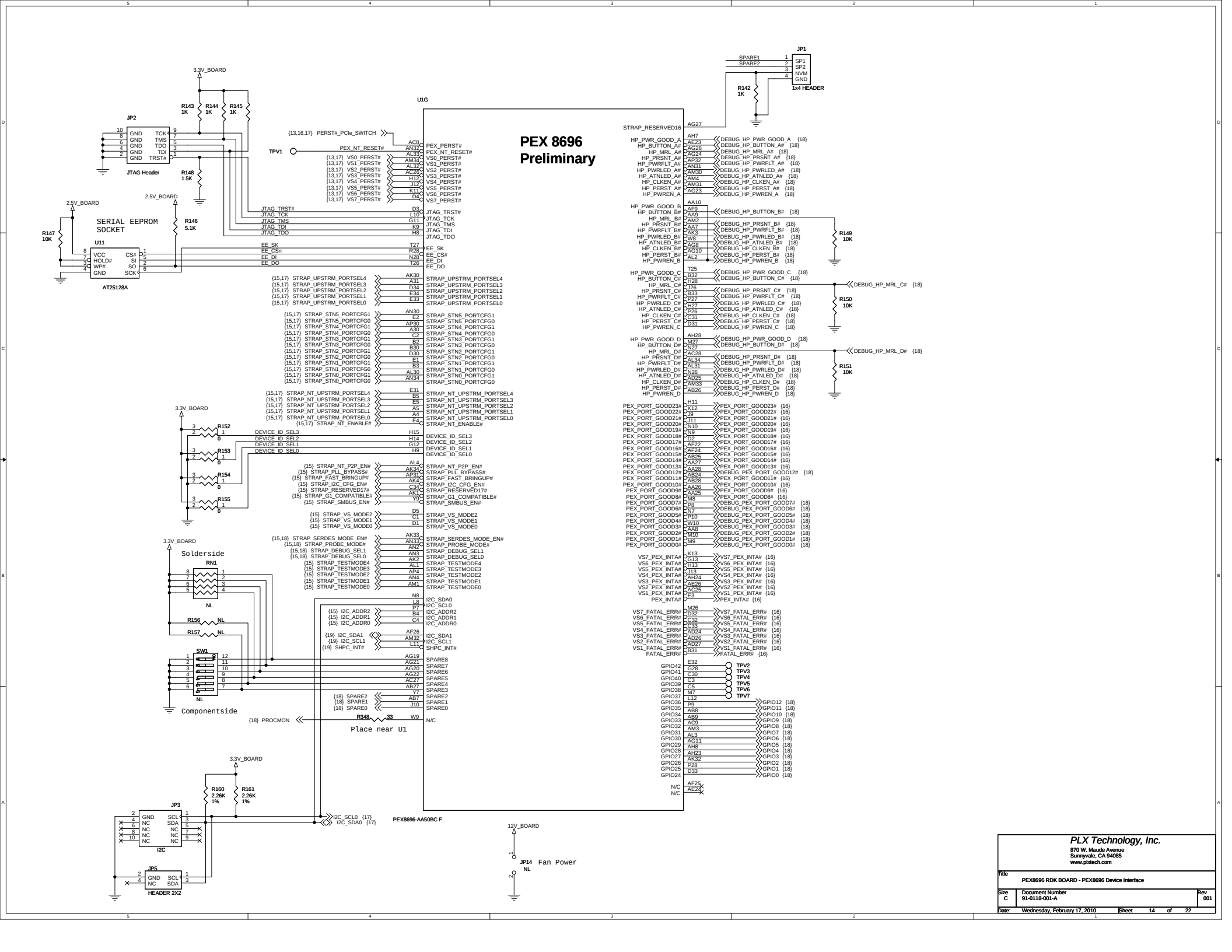

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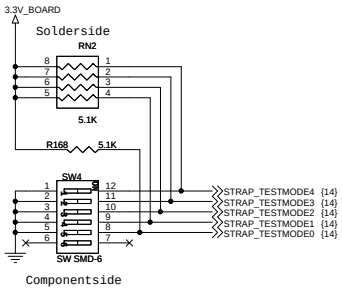
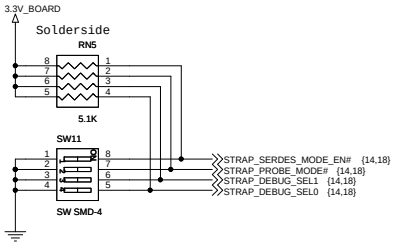
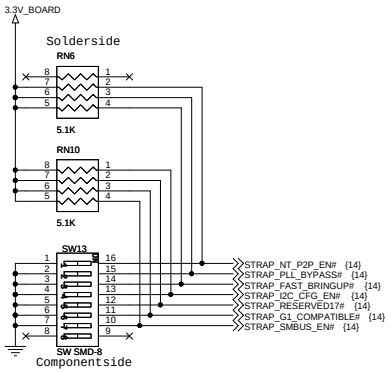
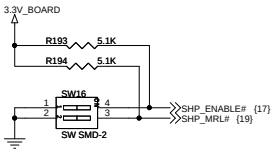
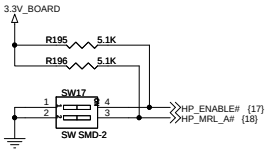
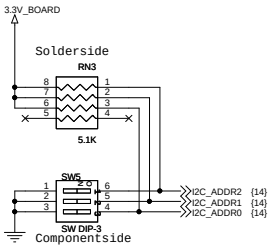


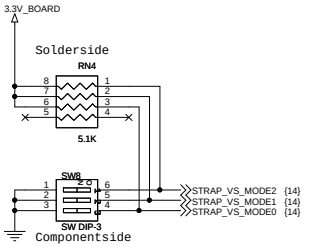


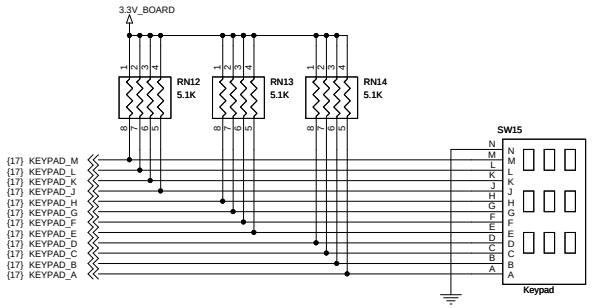


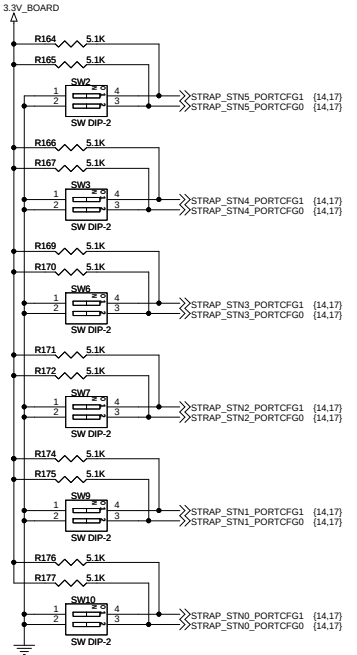


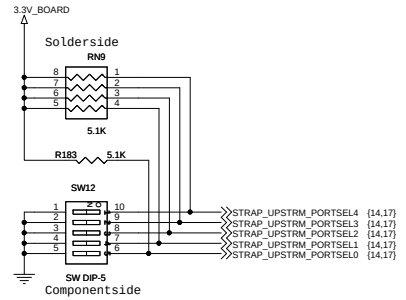


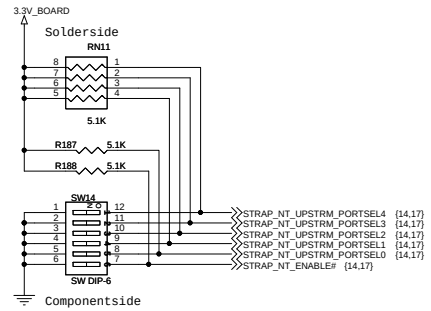




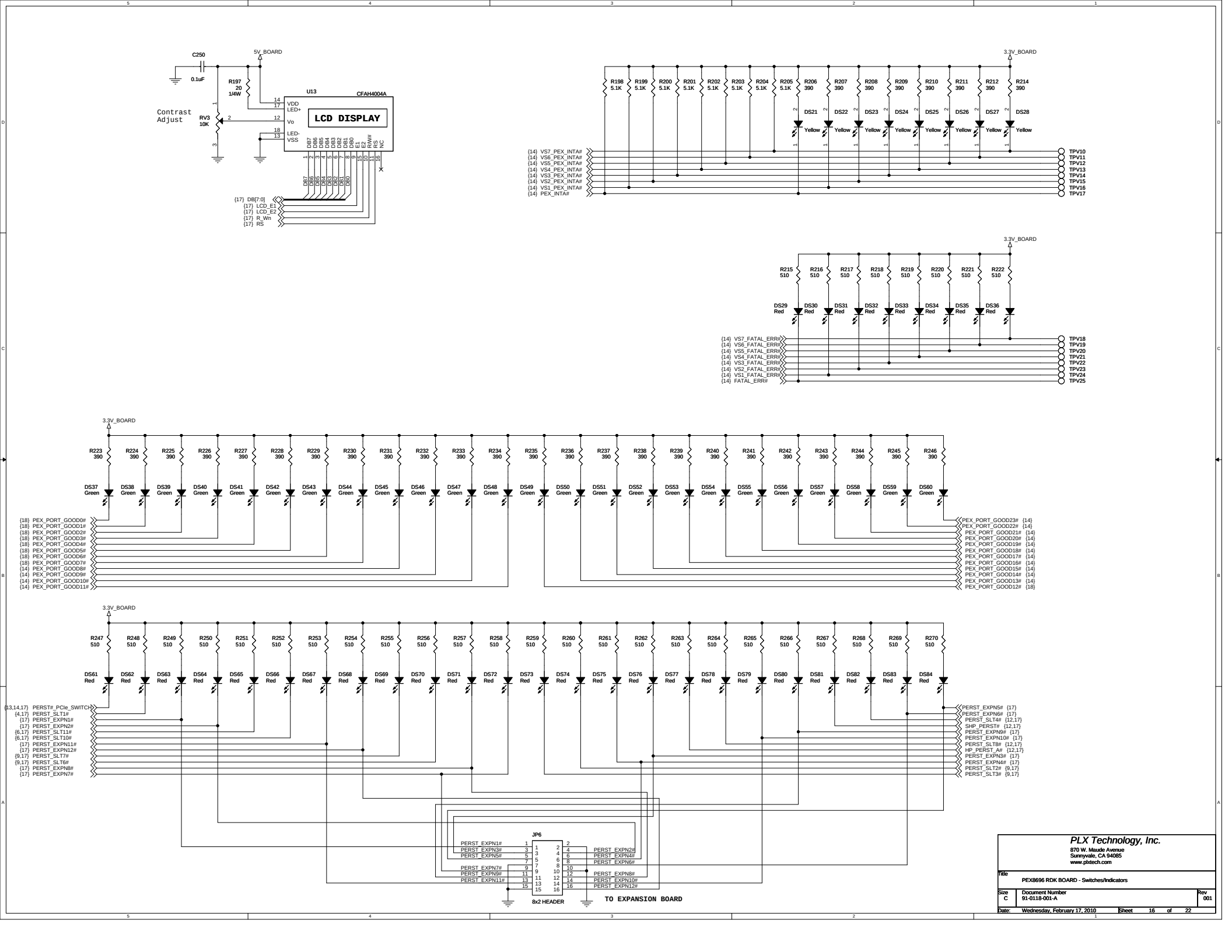








PLX Technology, Inc. 870 W. Maude Avenue Sunnyvale, CA 94085 www.plxtech.com		
Title PEX8696 RDK BOARD - Switches/Indicators		
Size C	**Document Number** 91-0118-001-A	**Rev** 001
Date: Monday, July 13, 2009	**Sheet** 15 of 22	


C250
0.1uF
5V_BOARD
R197
20
1/4W
U13
CFAH4004A
LCD DISPLAY
Contrast
Adjust
RV3
10K
VDD
LED+
Vo
LED-
VSS
DB7
DB6
DB5
DB4
DB3
DB2
DB1
DB0
E1
E2
R/W#
RS
NC
{17} DB[7:0]
{17} LCD_E1
{17} LCD_E2
{17} R_Wn
{17} RS
3.3V_BOARD
R198 5.1K
R199 5.1K
R200 5.1K
R201 5.1K
R202 5.1K
R203 5.1K
R204 5.1K
R205 5.1K
R206 390
R207 390
R208 390
R209 390
R210 390
R211 390
R212 390
R214 390
DS21 Yellow
DS22 Yellow
DS23 Yellow
DS24 Yellow
DS25 Yellow
DS26 Yellow
DS27 Yellow
DS28 Yellow
{14} VS7_PEX_INTA#
{14} VS6_PEX_INTA#
{14} VS5_PEX_INTA#
{14} VS4_PEX_INTA#
{14} VS3_PEX_INTA#
{14} VS2_PEX_INTA#
{14} VS1_PEX_INTA#
{14} PEX_INTA#
TPV10
TPV11
TPV12
TPV13
TPV14
TPV15
TPV16
TPV17
3.3V_BOARD
R215 510
R216 510
R217 510
R218 510
R219 510
R220 510
R221 510
R222 510
DS29 Red
DS30 Red
DS31 Red
DS32 Red
DS33 Red
DS34 Red
DS35 Red
DS36 Red
{14} VS7_FATAL_ERR#
{14} VS6_FATAL_ERR#
{14} VS5_FATAL_ERR#
{14} VS4_FATAL_ERR#
{14} VS3_FATAL_ERR#
{14} VS2_FATAL_ERR#
{14} VS1_FATAL_ERR#
{14} FATAL_ERR#
TPV18
TPV19
TPV20
TPV21
TPV22
TPV23
TPV24
TPV25
3.3V_BOARD
R223 390
R224 390
R225 390
R226 390
R227 390
R228 390
R229 390
R230 390
R231 390
R232 390
R233 390
R234 390
R235 390
R236 390
R237 390
R238 390
R239 390
R240 390
R241 390
R242 390
R243 390
R244 390
R245 390
R246 390
DS37 Green
DS38 Green
DS39 Green
DS40 Green
DS41 Green
DS42 Green
DS43 Green
DS44 Green
DS45 Green
DS46 Green
DS47 Green
DS48 Green
DS49 Green
DS50 Green
DS51 Green
DS52 Green
DS53 Green
DS54 Green
DS55 Green
DS56 Green
DS57 Green
DS58 Green
DS59 Green
DS60 Green
{18} PEX_PORT_GOOD0#
{18} PEX_PORT_GOOD1#
{18} PEX_PORT_GOOD2#
{18} PEX_PORT_GOOD3#
{18} PEX_PORT_GOOD4#
{18} PEX_PORT_GOOD5#
{18} PEX_PORT_GOOD6#
{18} PEX_PORT_GOOD7#
{14} PEX_PORT_GOOD8#
{14} PEX_PORT_GOOD9#
{14} PEX_PORT_GOOD10#
{14} PEX_PORT_GOOD11#
PEX_PORT_GOOD23# {14}
PEX_PORT_GOOD22# {14}
PEX_PORT_GOOD21# {14}
PEX_PORT_GOOD20# {14}
PEX_PORT_GOOD19# {14}
PEX_PORT_GOOD18# {14}
PEX_PORT_GOOD17# {14}
PEX_PORT_GOOD16# {14}
PEX_PORT_GOOD15# {14}
PEX_PORT_GOOD14# {14}
PEX_PORT_GOOD13# {14}
PEX_PORT_GOOD12# {18}
3.3V_BOARD
R247 510
R248 510
R249 510
R250 510
R251 510
R252 510
R253 510
R254 510
R255 510
R256 510
R257 510
R258 510
R259 510
R260 510
R261 510
R262 510
R263 510
R264 510
R265 510
R266 510
R267 510
R268 510
R269 510
R270 510
DS61 Red
DS62 Red
DS63 Red
DS64 Red
DS65 Red
DS66 Red
DS67 Red
DS68 Red
DS69 Red
DS70 Red
DS71 Red
DS72 Red
DS73 Red
DS74 Red
DS75 Red
DS76 Red
DS77 Red
DS78 Red
DS79 Red
DS80 Red
DS81 Red
DS82 Red
DS83 Red
DS84 Red
{13,14,17} PERST#_PCIe_SWITCH
{4,17} PERST_SLT1#
{17} PERST_EXPN1#
{17} PERST_EXPN2#
{6,17} PERST_SLT11#
{6,17} PERST_SLT10#
{17} PERST_EXPN11#
{17} PERST_EXPN12#
{9,17} PERST_SLT7#
{9,17} PERST_SLT6#
{17} PERST_EXPN8#
{17} PERST_EXPN7#
PERST_EXPN5# {17}
PERST_EXPN6# {17}
PERST_SLT4# {12,17}
SHP_PERST# {12,17}
PERST_EXPN9# {17}
PERST_EXPN10# {17}
PERST_SLT8# {12,17}
HP_PERST_A# {12,17}
PERST_EXPN3# {17}
PERST_EXPN4# {17}
PERST_SLT2# {9,17}
PERST_SLT3# {9,17}
JP6
PERST_EXPN1#
PERST_EXPN3#
PERST_EXPN5#
PERST_EXPN7#
PERST_EXPN9#
PERST_EXPN11#
PERST_EXPN2#
PERST_EXPN4#
PERST_EXPN6#
PERST_EXPN8#
PERST_EXPN10#
PERST_EXPN12#
8x2 HEADER
TO EXPANSION BOARD
PLX Technology, Inc.
870 W. Maude Avenue
Sunnyvale, CA 94085
www.plxtech.com
Title
PEX8696 RDK BOARD - Switches/Indicators
Size C
Document Number 91-0118-001-A
Rev 001
Date: Wednesday, February 17, 2010
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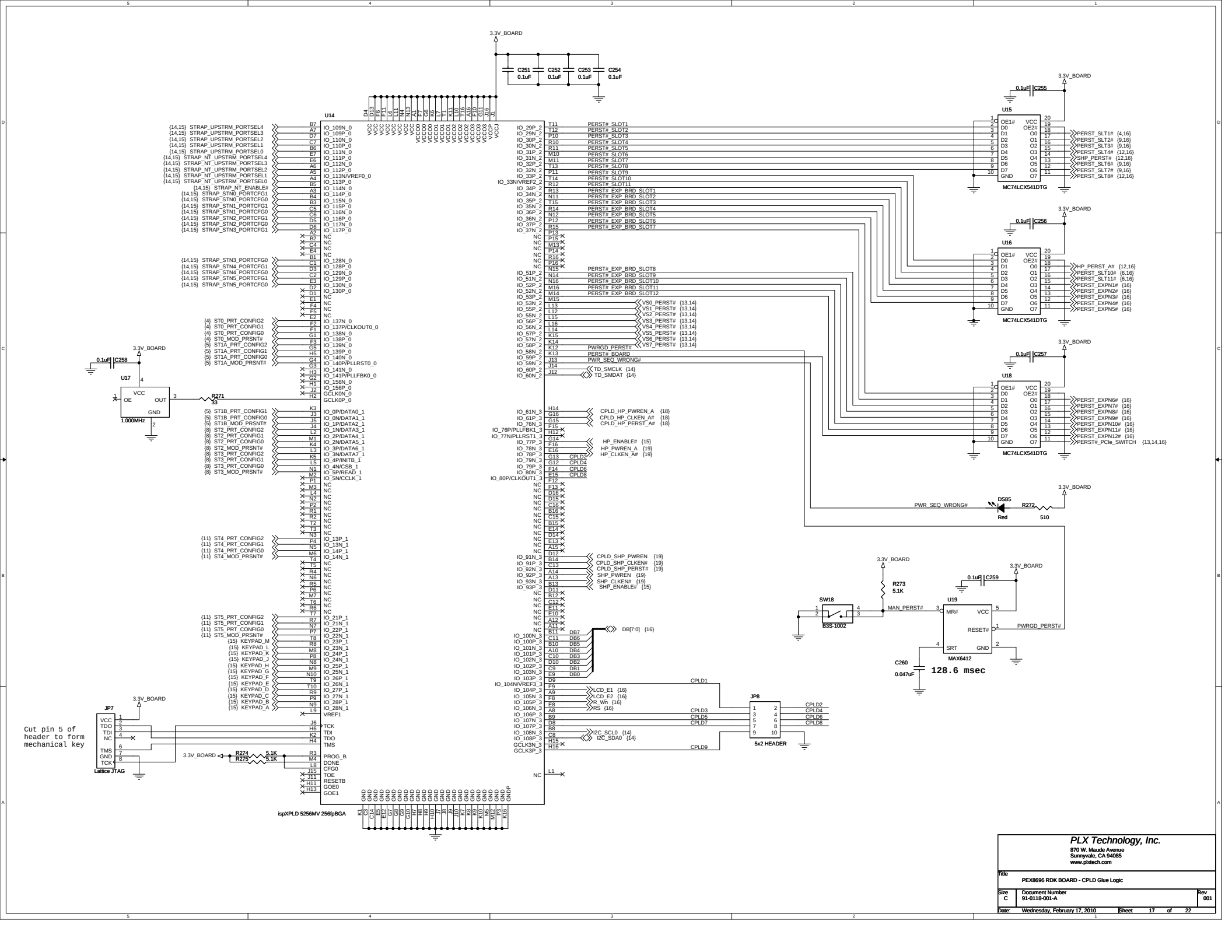

PLX Technology, Inc.	
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Title	PEX8696 RDK BOARD - CPLD Glue Logic
Size C	**Document Number** 91-0118-001-A **Rev** 001
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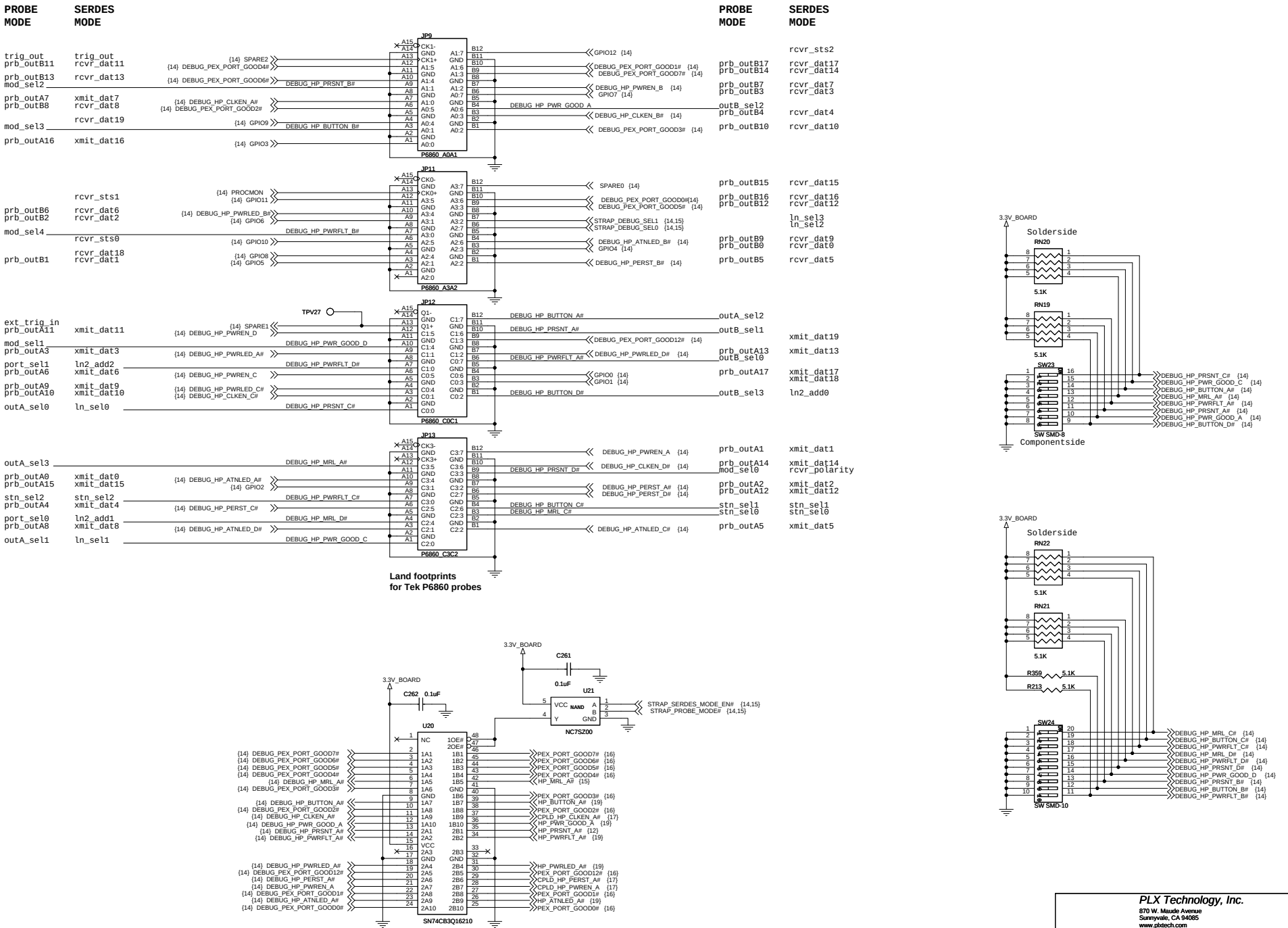
PROBE MODE
SERDES MODE
trig_out
prb_outB11
prb_outB13
mod_sel2
prb_outA7
prb_outB8
mod_sel3
prb_outA16
trig_out
rcvr_dat11
rcvr_dat13
xmit_dat7
rcvr_dat8
rcvr_dat19
xmit_dat16
JP9
P6860_A0A1
rcvr_sts2
prb_outB17 rcvr_dat17
prb_outB14 rcvr_dat14
prb_outB7 rcvr_dat7
prb_outB3 rcvr_dat3
prb_outB4 rcvr_dat4
prb_outB10 rcvr_dat10
rcvr_sts1
prb_outB6
prb_outB2
mod_sel4
rcvr_sts0
prb_outB1
rcvr_dat6
rcvr_dat2
rcvr_dat18
rcvr_dat1
JP11
P6860_A3A2
prb_outB15 rcvr_dat15
prb_outB16 rcvr_dat16
prb_outB12 rcvr_dat12
ln_sel3
ln_sel2
prb_outB9 rcvr_dat9
prb_outB0 rcvr_dat0
prb_outB5 rcvr_dat5
ext_trig_in
prb_outA11
mod_sel1
prb_outA3
port_sel1
prb_outA6
prb_outA9
prb_outA10
outA_sel0
xmit_dat11
xmit_dat3
ln2_add2
xmit_dat6
xmit_dat9
xmit_dat10
ln_sel0
TPV27
JP12
P6860_C0C1
outA_sel2
outB_sel1
xmit_dat19
prb_outA13 xmit_dat13
outB_sel0
prb_outA17 xmit_dat17
xmit_dat18
outB_sel3
ln2_add0
outA_sel3
prb_outA0
prb_outA15
stn_sel2
prb_outA4
port_sel0
prb_outA8
outA_sel1
xmit_dat0
xmit_dat15
ln_sel1
xmit_dat8
JP13
P6860_C3C2
prb_outA1 xmit_dat1
prb_outA14 xmit_dat14
mod_sel0 rcvr_polarity
prb_outA2 xmit_dat2
prb_outA12 xmit_dat12
stn_sel1 stn_sel1
stn_sel0 stn_sel0
prb_outA5 xmit_dat5
Land footprints
for Tek P6860 probes
3.3V_BOARD
C262 0.1uF
U20
SN74CB3Q16210
C261
0.1uF
U21
NC7SZ00
3.3V_BOARD
Solderside
RN20
RN19
RN22
RN21
5.1K
R359 5.1K
R213 5.1K
SW23
SW24
SW SMD-8
SW SMD-10
Componentside
PLX Technology, Inc.
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Title
PEX8696 RDK BOARD - Device Debug Interface
Size C
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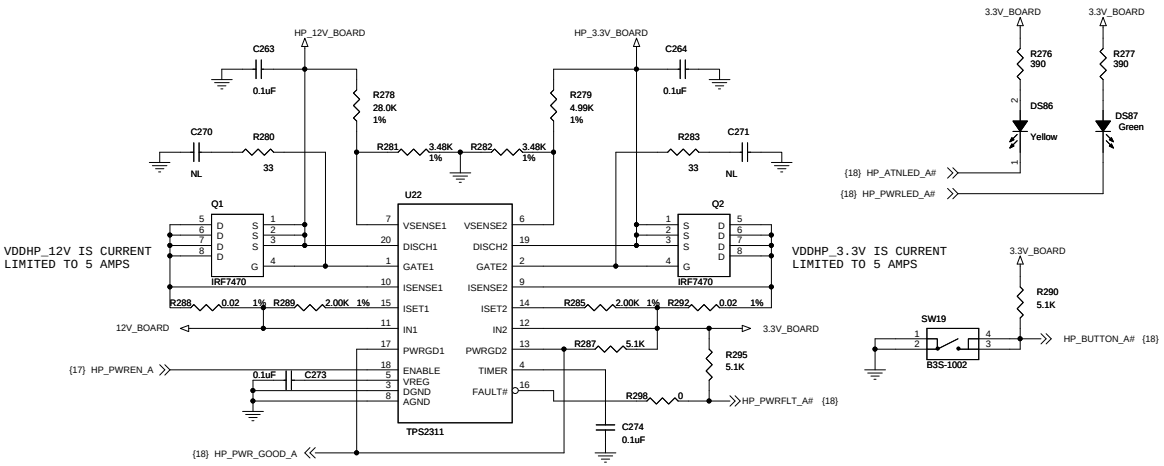
PARALLEL HOT PLUG TO PORT 16, SLOT 9

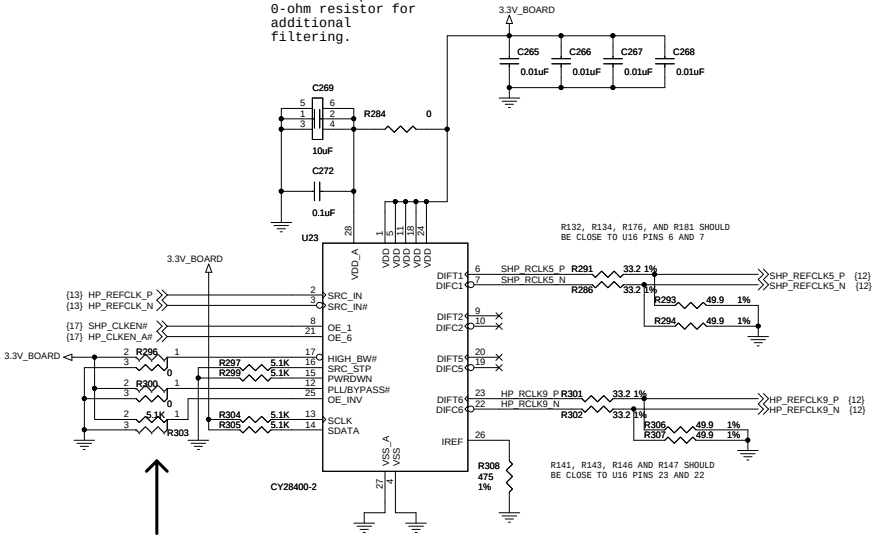


VDDHP_12V IS CURRENT LIMITED TO 5 AMPS

VDDHP_3.3V IS CURRENT LIMITED TO 5 AMPS

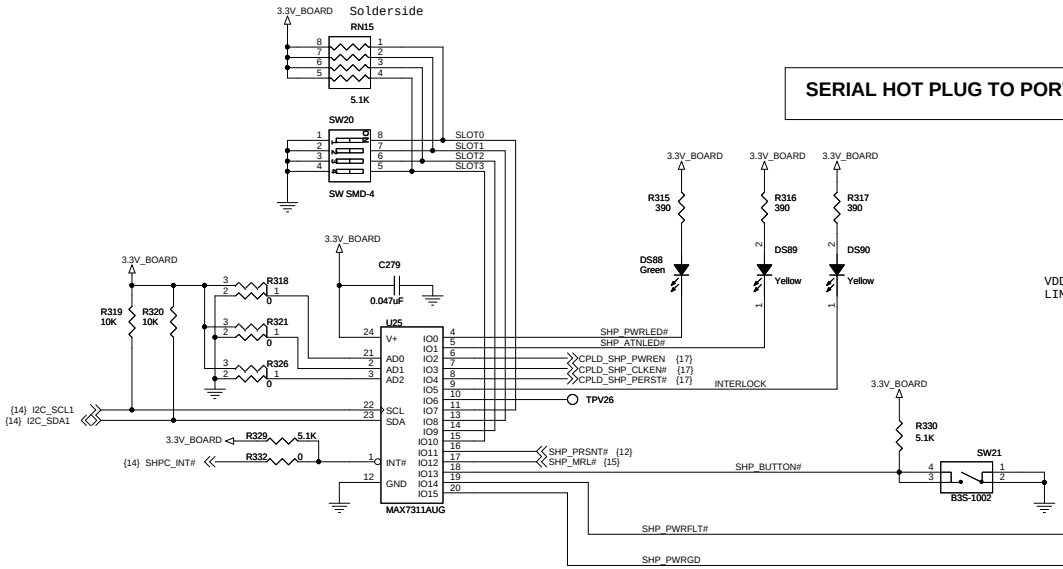
HOT PLUG REFCLKS

A ferrite bead can be used in place of 0-ohm resistor for additional filtering.



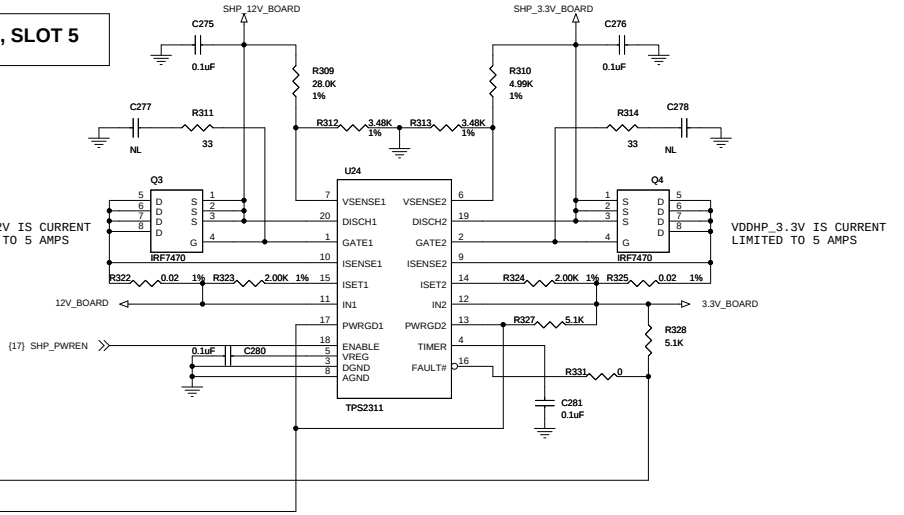
These are custom 0603 resistor footprints that have 3 pads.

SERIAL HOT PLUG TO PORT 20, SLOT 5



VDDHP_12V IS CURRENT LIMITED TO 5 AMPS

VDDHP_3.3V IS CURRENT LIMITED TO 5 AMPS



PLX Technology, Inc.
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Sunnyvale, CA 94085
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Title	PEX8696 RDK BOARD - Switches/Indicators	
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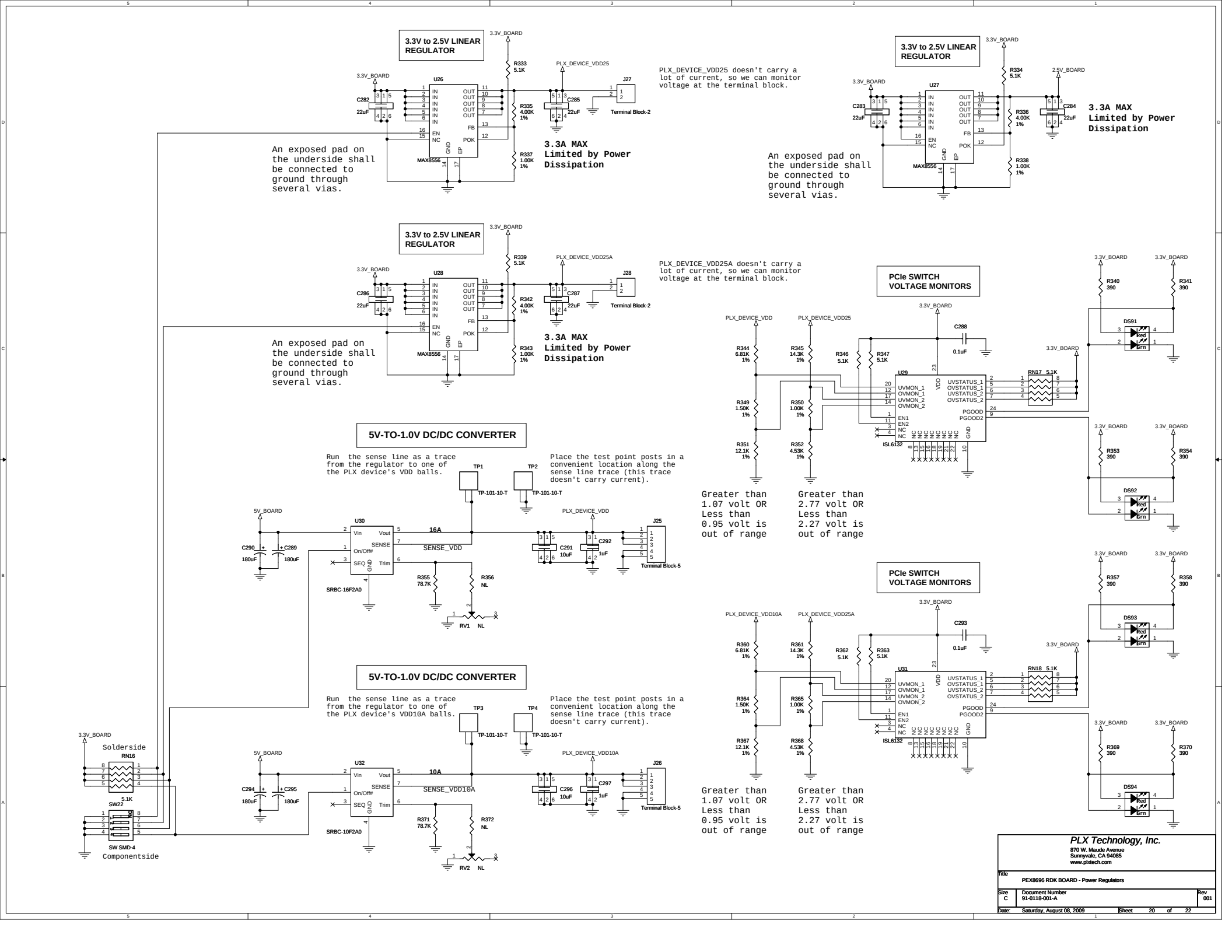
3.3V to 2.5V LINEAR REGULATOR
3.3V_BOARD
U26
MAX8556
R333 5.1K
R335 4.00K 1%
R337 1.00K 1%
C282 22uF
C285 22uF
PLX_DEVICE_VDD25
J27
Terminal Block-2
PLX_DEVICE_VDD25 doesn't carry a lot of current, so we can monitor voltage at the terminal block.
An exposed pad on the underside shall be connected to ground through several vias.
3.3A MAX Limited by Power Dissipation
3.3V to 2.5V LINEAR REGULATOR
U27
2.5V_BOARD
R334 5.1K
R336 4.00K 1%
R338 1.00K 1%
C283 22uF
C284 22uF
3.3A MAX Limited by Power Dissipation
An exposed pad on the underside shall be connected to ground through several vias.
3.3V to 2.5V LINEAR REGULATOR
U28
R339 5.1K
R342 4.00K 1%
R343 1.00K 1%
C286 22uF
C287 22uF
PLX_DEVICE_VDD25A
J28
PLX_DEVICE_VDD25A doesn't carry a lot of current, so we can monitor voltage at the terminal block.
An exposed pad on the underside shall be connected to ground through several vias.
3.3A MAX Limited by Power Dissipation
PCIe SWITCH VOLTAGE MONITORS
U29
ISL6132
PLX_DEVICE_VDD
PLX_DEVICE_VDD25
R344 6.81K 1%
R345 14.3K 1%
R346 5.1K
R347 5.1K
R349 1.50K 1%
R350 1.00K 1%
R351 12.1K 1%
R352 4.53K 1%
C288 0.1uF
RN17 5.1K
DS91
DS92
R340 390
R341 390
R353 390
R354 390
Greater than 1.07 volt OR Less than 0.95 volt is out of range
Greater than 2.77 volt OR Less than 2.27 volt is out of range
5V-TO-1.0V DC/DC CONVERTER
Run the sense line as a trace from the regulator to one of the PLX device's VDD balls.
Place the test point posts in a convenient location along the sense line trace (this trace doesn't carry current).
U30
SRBC-16F2A0
TP1
TP2
TP-101-10-T
16A
SENSE_VDD
PLX_DEVICE_VDD
J25
Terminal Block-5
C290 180uF
C289 180uF
C291 10uF
C292 1uF
R355 78.7K
R356 NL
RV1 NL
5V-TO-1.0V DC/DC CONVERTER
Run the sense line as a trace from the regulator to one of the PLX device's VDD10A balls.
Place the test point posts in a convenient location along the sense line trace (this trace doesn't carry current).
U32
SRBC-10F2A0
TP3
TP4
10A
SENSE_VDD10A
PLX_DEVICE_VDD10A
J26
C294 180uF
C295 180uF
C296 10uF
C297 1uF
R371 78.7K
R372 NL
RV2 NL
Solderside
Componentside
RN16 5.1K
SW22
SW SMD-4
PCIe SWITCH VOLTAGE MONITORS
U31
ISL6132
PLX_DEVICE_VDD10A
PLX_DEVICE_VDD25A
R360 6.81K 1%
R361 14.3K 1%
R362 5.1K
R363 5.1K
R364 1.50K 1%
R365 1.00K 1%
R367 12.1K 1%
R368 4.53K 1%
C293 0.1uF
RN18 5.1K
DS93
DS94
R357 390
R358 390
R369 390
R370 390
Greater than 1.07 volt OR Less than 0.95 volt is out of range
Greater than 2.77 volt OR Less than 2.27 volt is out of range
PLX Technology, Inc.
870 W. Maude Avenue
Sunnyvale, CA 94085
www.plxtech.com
Title
PEX8696 RDK BOARD - Power Regulators
Size C
Document Number 91-0118-001-A
Rev 001
Date: Saturday, August 08, 2009
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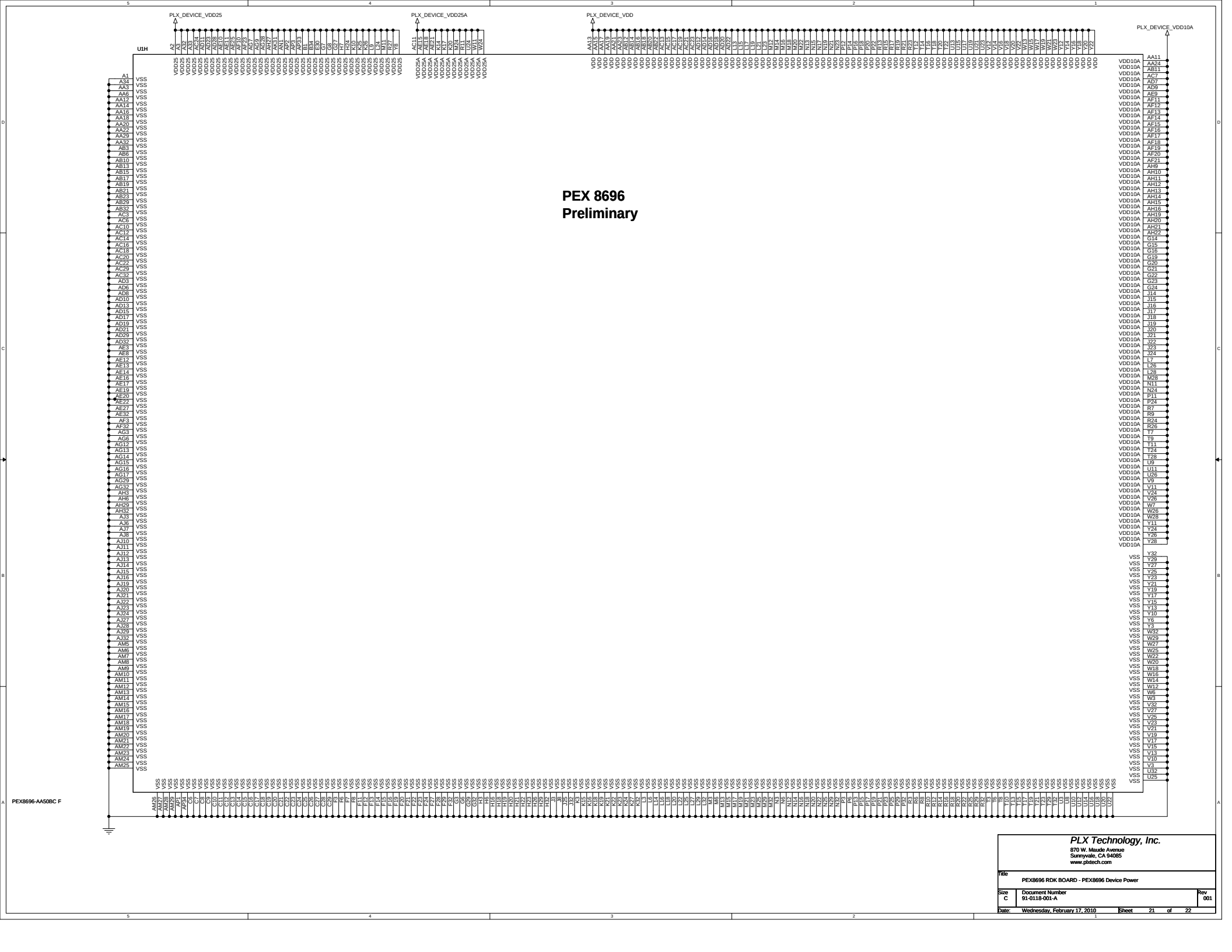

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Title: PEX8696 RDK BOARD - PEX8696 Device Power

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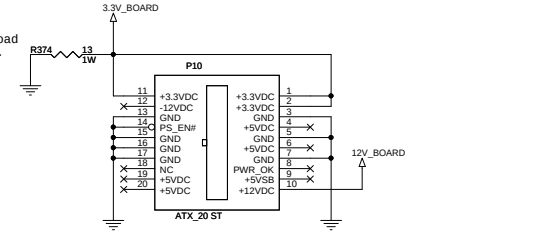
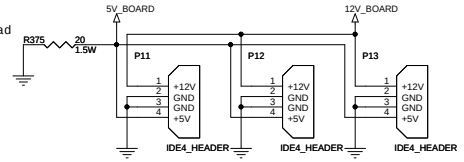
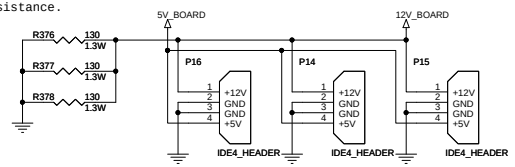
250 mA load resistor.



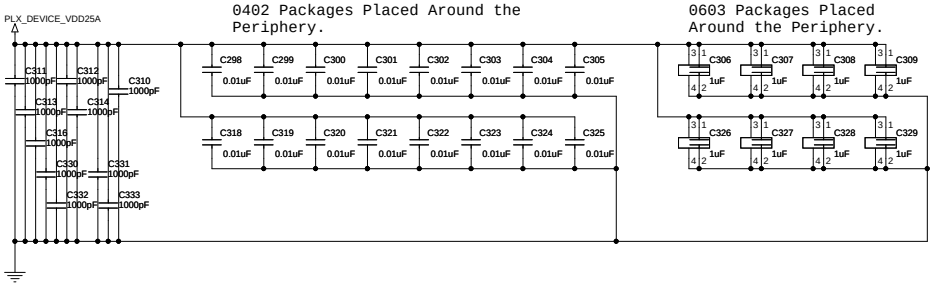
250 mA load resistor.



275 mA load resistance.



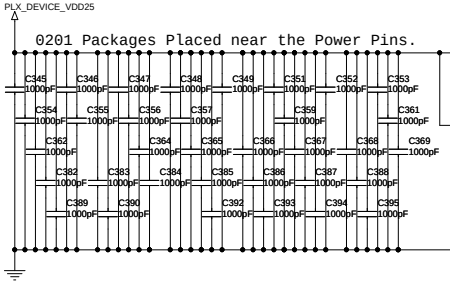
0201 Packages Placed near the Power Pins.



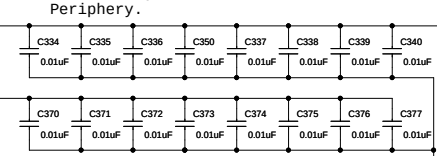
0402 Packages Placed Around the Periphery.

0603 Packages Placed Around the Periphery.

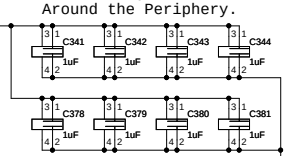
0201 Packages Placed near the Power Pins.



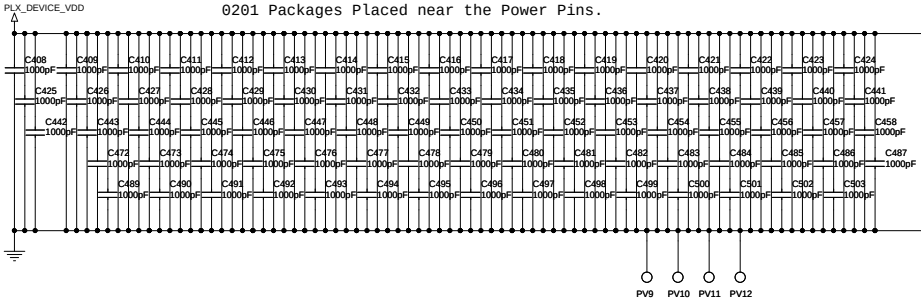
0402 Packages Placed Around the Periphery.



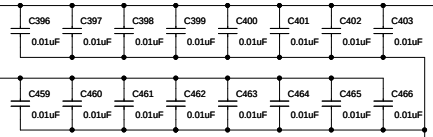
0603 Packages Placed Around the Periphery.



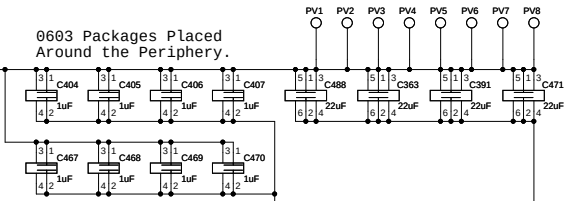
0201 Packages Placed near the Power Pins.



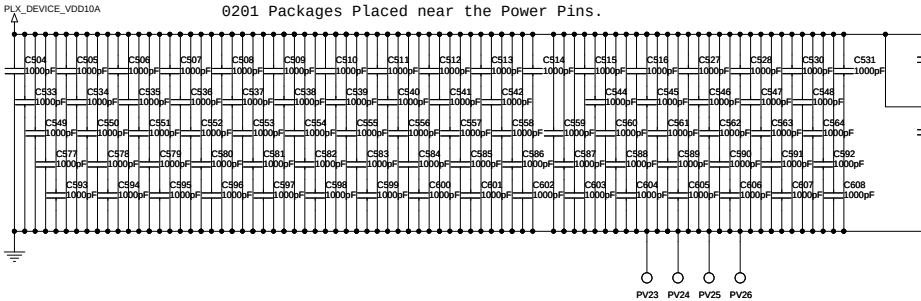
0402 Packages Placed Around the Periphery.



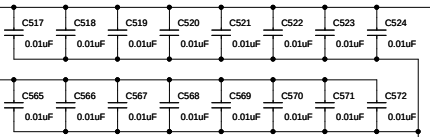
0603 Packages Placed Around the Periphery.



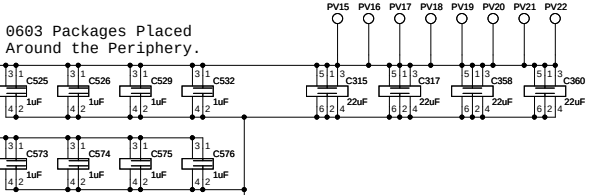
0201 Packages Placed near the Power Pins.



0402 Packages Placed Around the Periphery.



0603 Packages Placed Around the Periphery.



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