PERICOM
Enabling Serial Connectivity

Application Note

PI2EQX4401D
## PI2EQX4401D x1PCIe Storage System Rev. A User Manual

Introduction
With the use of Pericom x1PCIe Storage System, files can be transferred from a notebook, which a x1PCIe slot comes with, to a portable eSATA Hard Disk or an eSATA DVD R/W, or vice versa, by connecting an eSATA II Express card in between. Users can enjoy immediate large back up capacity using x1PCIe from now on.

Key Components
The whole x1PCIe Storage System contains the following items:

- Pericom 15-pin x1PCIe Cable (Please refer to Appendix A for pin assignment)
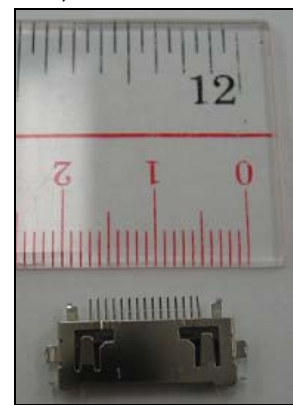
- Downstream System Board

- Upstream System Board

- DVD R/W Device

- Portable Hard Disk

- ITX Case
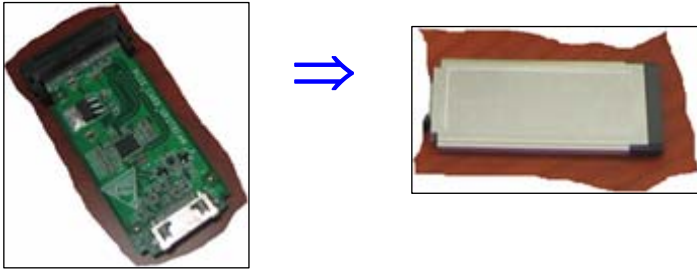

- eSATA II Express Card

- eSATA-to-eSATA Cable

Storage System Setup

Before inserting to x1PCIe slot of a notebook, an Upstream System Board is protected by a case as below:
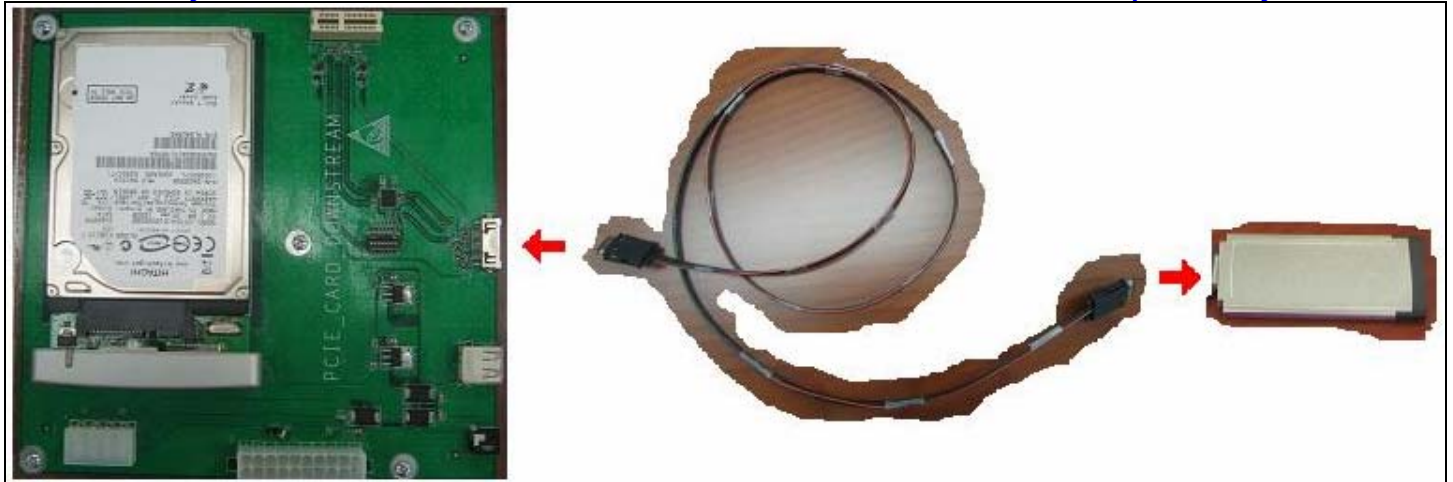

In parallel, the Upstream System Board is connected to one end of Pericom 15-pin x1PCIe Cable at connector J3 on the schematic. The Downstream System Board is connected to the other end of the cable at connector J2. Please refer to Appendices B and C for Storage System schematic and layout.

Downstream System Board　　　　　　　　　　**x1PCIe Cable**　　　　　　　　　**Upstream System Board**

On the Downstream System Board, an off-the-self eSATA II Express Card is inserted at a x1PCIe Edge Finger Connector, J1 on the schematic, in order to transfer signal collected from x1PCIe edge finger to its eSATA connectors.

At each of the eSATA connectors, a portable Hard Disk or a DVD R/W is connected via an eSATA-to-eSATA cable.

eSATA II Express Card   **eSATA-to-eSATA Cable**   **Portable Hard Disk**

A homemade power cord connects the power connector of Portable Hard Disk to a 4-pin supply connector, J8 on the schematic, mounted on the Downstream System Board to get the power from the board. The entire Downstream System Board is powered up by the ATX power supply, which is connected to J5 on the schematic and provided in the ITX case.
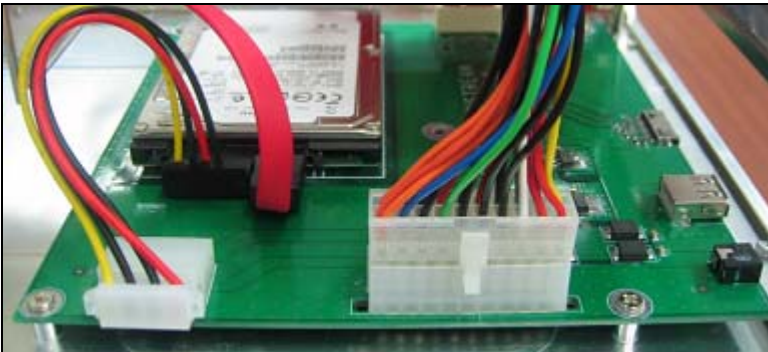

The power of DVD R/W device is supplied by the ATX power supply directly.

A jumper, at JP1 on the schematic, beside connector J5 is to short a pin, namely PS_ON#, at ATX power supply connector to Ground so as to signal the ATX power supply to output power to Downstream System Board.


The Downstream System Board can be powered down by disconnecting the jumper JP1 or powered off by disconnecting the power cord plugged to the ITX case.

Application Note

The Upstream System Board should be inserted to the x1PCIe slot of the notebook with correct pin alignment.
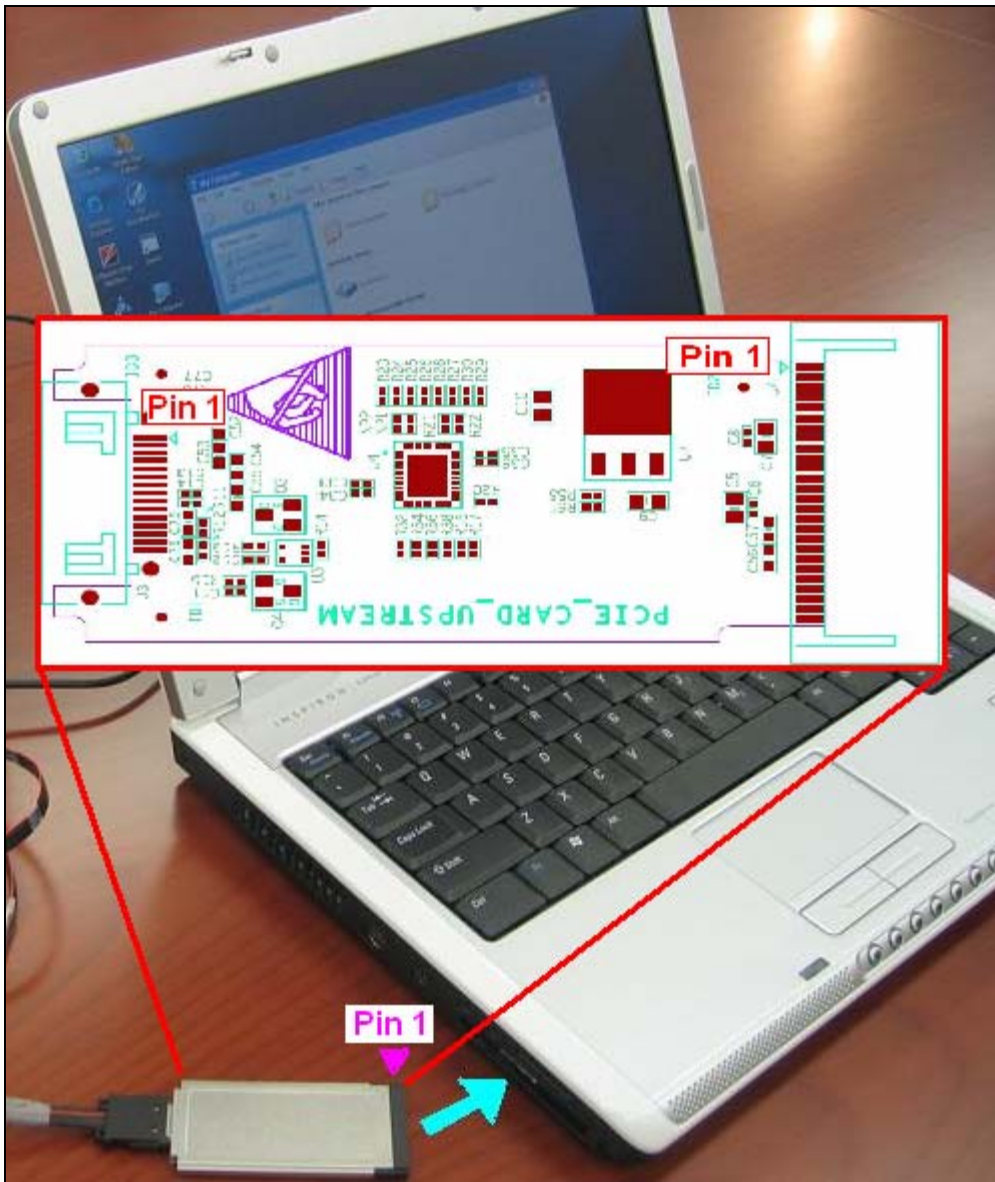
After connecting each component to the Upstream/Downstream System Board, the entire Storage System is ready to be powered up by connecting the power cord to the back of the ITX case if it was not done so and putting a jumper to connector JP1, at PS_ON# pin.
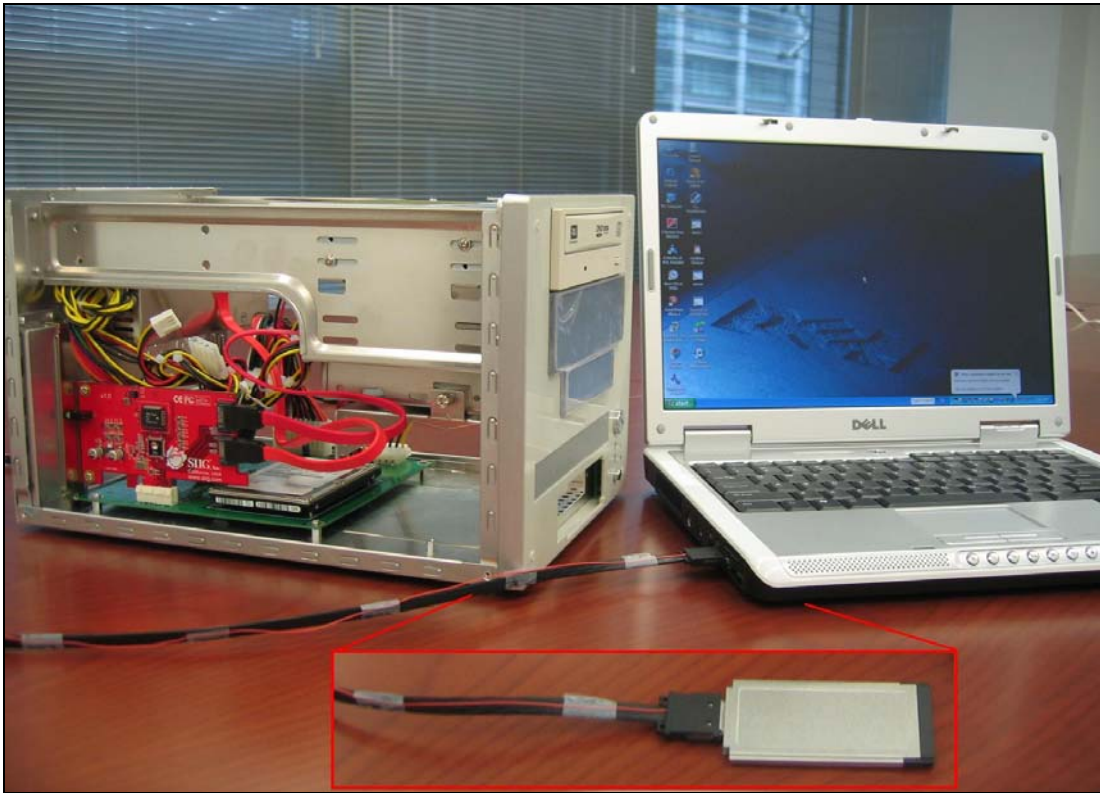
After powering up the notebook, both Portable Hard Disk and DVD R/W can be automatically detected and data transfer can be proceeded. Remark: DVD needs to be formatted before use.
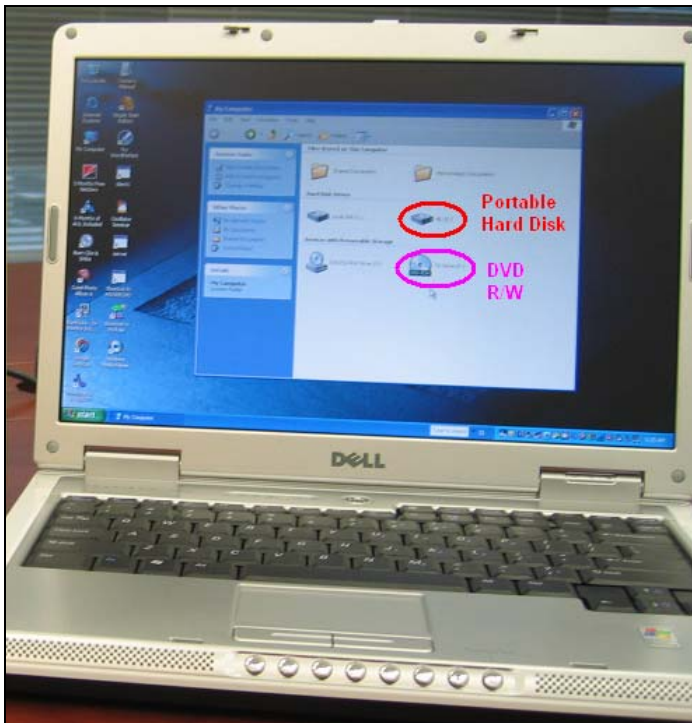
Appendix A: ATX Main Power Connector Pin Assignment
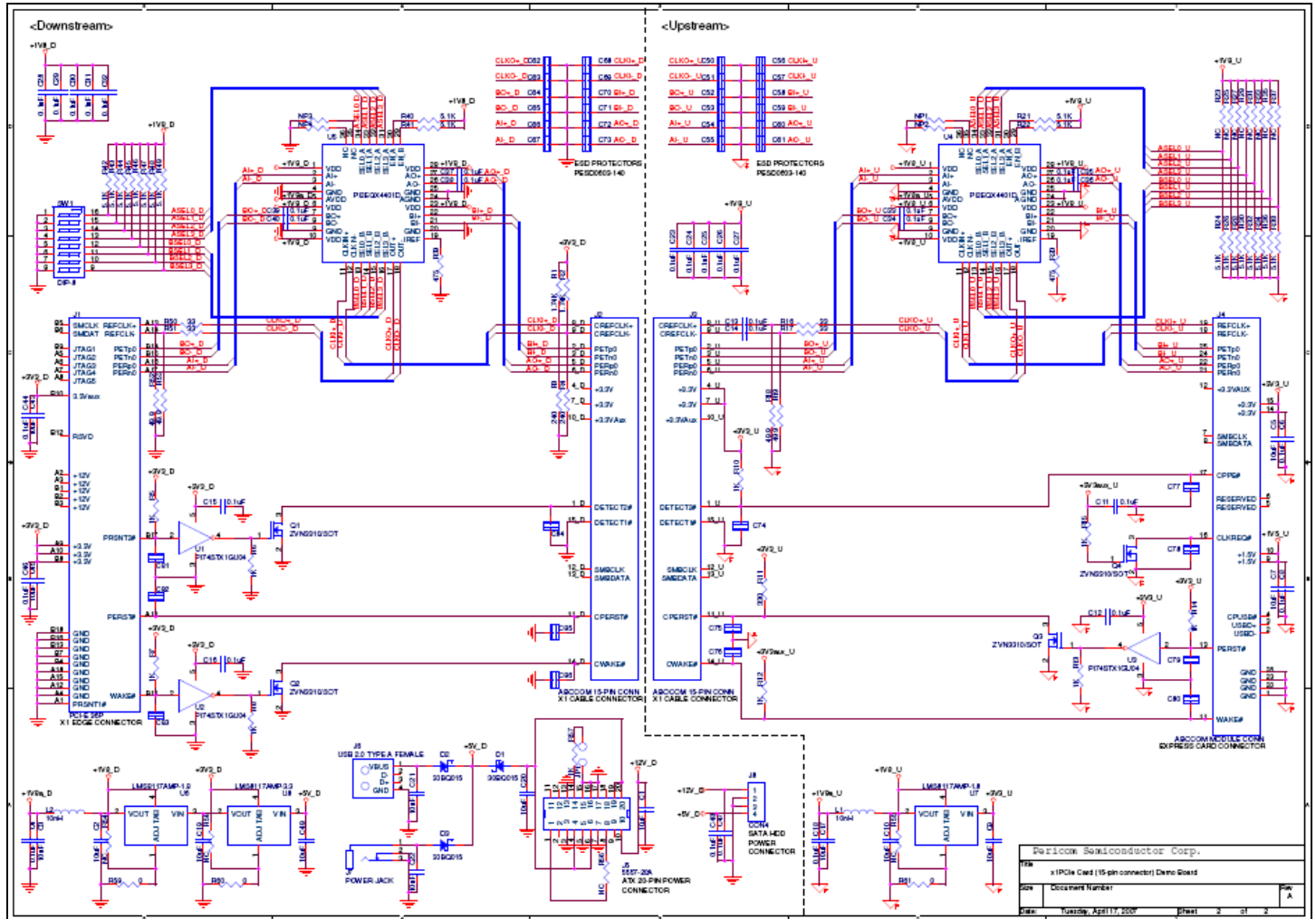
20-pin ATX Main Power Connector

Pin	Signal	Color	Pin	Signal	Color
1	+3.3VDC	Orange	11 [11]	+3.3VDC [+3.3 V default sense]	Orange [Brown]
2	+3.3VDC	Orange	12	-12VDC	Blue
3	COM	Black	13	COM	Black
4	+5VDC	Red	14	PS_ON#	Green
5	COM	Black	15	COM	Black
6	+5VDC	Red	16	COM	Black
7	COM	Black	17	COM	Black
8	PWR_OK	Gray	18	-5VDC	White
9	+5VSB	Purple	19	+5VDC	Red
10	+12VDC	Yellow	20	+5VDC	Red

24-pin ATX Main Power Connector

Pin	Signal	Color	Pin	Signal	Color
1	+3.3VDC	Orange	13 [13]	+3.3VDC [+3.3 V default sense]	Orange [Brown]
2	+3.3VDC	Orange	14	-12VDC	Blue
3	COM	Black	15	COM	Black
4	+5VDC	Red	16	PS_ON#	Green
5	COM	Black	17	COM	Black
6	+5VDC	Red	18	COM	Black
7	COM	Black	19	COM	Black
8	PWR_OK	Gray	20	Reserved	N/C
9	+5VSB	Purple	21	+5VDC	Red
10	+12 V1DC	Yellow	22	+5VDC	Red
11	+12 V1DC	Yellow	23	+5 VDC	Red
12	+3.3 VDC	Orange	24	COM	Black

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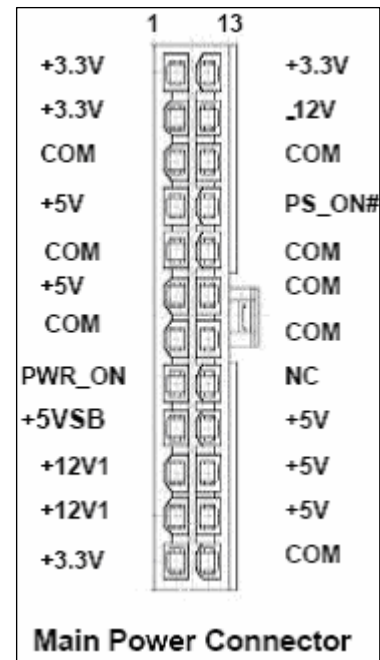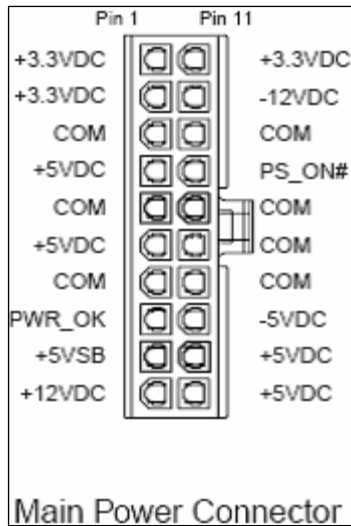
Appendix B: Storage System Schematic

Pericom Semiconductor Corp.
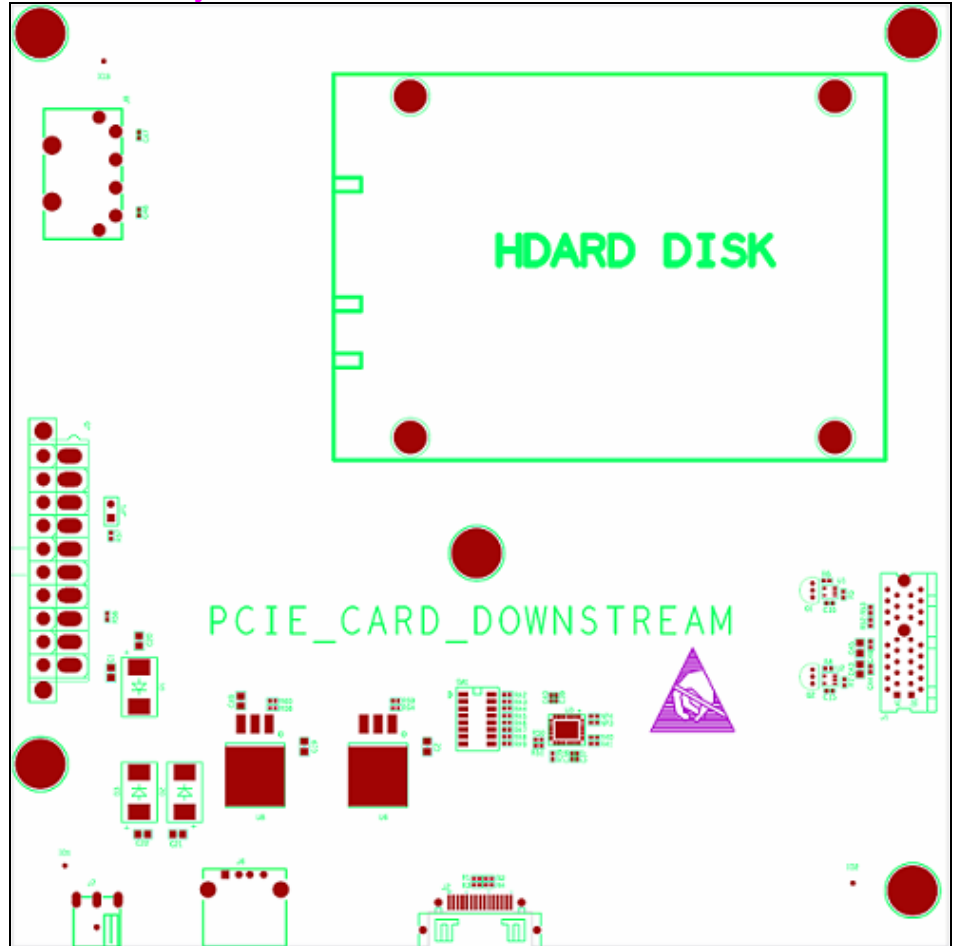www.pericom.com

Appendix C: Storage System Layout

Upstream System Board
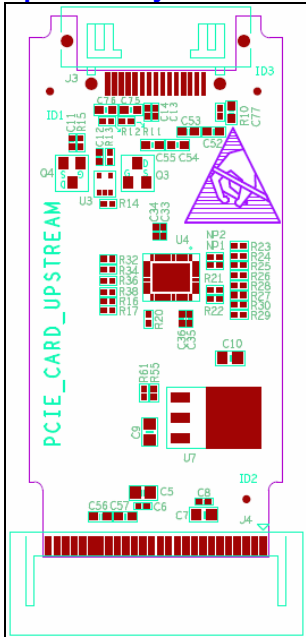
Downstream System Board

Appendix D: PCB Layout Requirements

a. Stack Up:

Plane	Material	Thickness (mil)
Signal		1.9
Prepreg	1080 + 2116	7.3
Ground		1.2
Core		44
Power		1.2
Prepreg	1080 + 2116	7.3
Signal		1.9

b. Isolation Spacing = 30 mil

c. Width & Spacing (W/S) of 100Ω Differential Trace = 9.0/11 mil
    Width of 50Ω SE Trace = 12 mil

Appendix E: BOM List

Item	Quantity	Reference	Description
1	15	C1, C2, C3, C5, C7, C9, C10, C17, C19, C20, C21, C22, C43, C45, C49	10uF Capacitor
2	32	C4, C6, C8, C11, C12, C13, C14, C15, C16, C18, C23, C24, C25, C26, C27, C28, C29, C30, C31, C32, C33, C34, C35, C36, C37, C38, C39, C40, C44, C46, C47, C48	0.1uF Capacitor
3	37	C50, C51, C52, C53, C54, C55, C56, C57, C58, C59, C60, C61, C62, C63, C64, C65, C66, C67, C68, C69, C70, C71, C72, C73, C74, C75, C76, C77, C78, C79, C80, C81, C82, C83, C84, C85, C86	ESD Protector
4	3	D1, D2, D3	Schottky Diode
5	1	J1	x1PCIe Edge Card Connector
6	2	J2, J3	Pericom x1PCIe 15-pin cable connector
7	1	J4	Express Card Module Connector
8	1	J5	ATX 20-Pin Main Power Connector
9	1	J8	eSATA Hard Disk 4-pin Power Connector
10	1	JP1	2-pin Header
11	2	L1, L2	10nH Inductor
12	4	Q1, Q2, Q3, Q4	100mA npn Transistor
13	3	R59, R60, R61	0.0Ω Resistor
14	4	R16, R17, R50, R51	33.0Ω Resistor
15	4	R18, R19, R52, R53	49.9Ω Resistor
16	2	R3, R4	240Ω Resistor
17	1	R11	330Ω Resistor
18	2	R20, R39	475Ω Resistor
19	10	R5, R6, R7, R8, R10, R12, R13, R14, R15, R57	1.00K Resistor
20	2	R1, R2	1.74K Resistor
21	20	R21, R22, R24, R26, R28, R30, R32, R34, R36, R38, R40, R41, R42, R43, R44, R45, R46, R47, R48, R49	5.10K Resistor
22	1	SW1	SPDT Toggle Switch
23	3	U1, U2, U3	Unbuffered Inverter (PI74STX1GU04)
24	2	U4, U5	Repeater / Equalizer (PI2EQX4401D)
25	2	U6, U7	1A 1.8V Regulator
26	1	U8	1A 3.3V Regulator