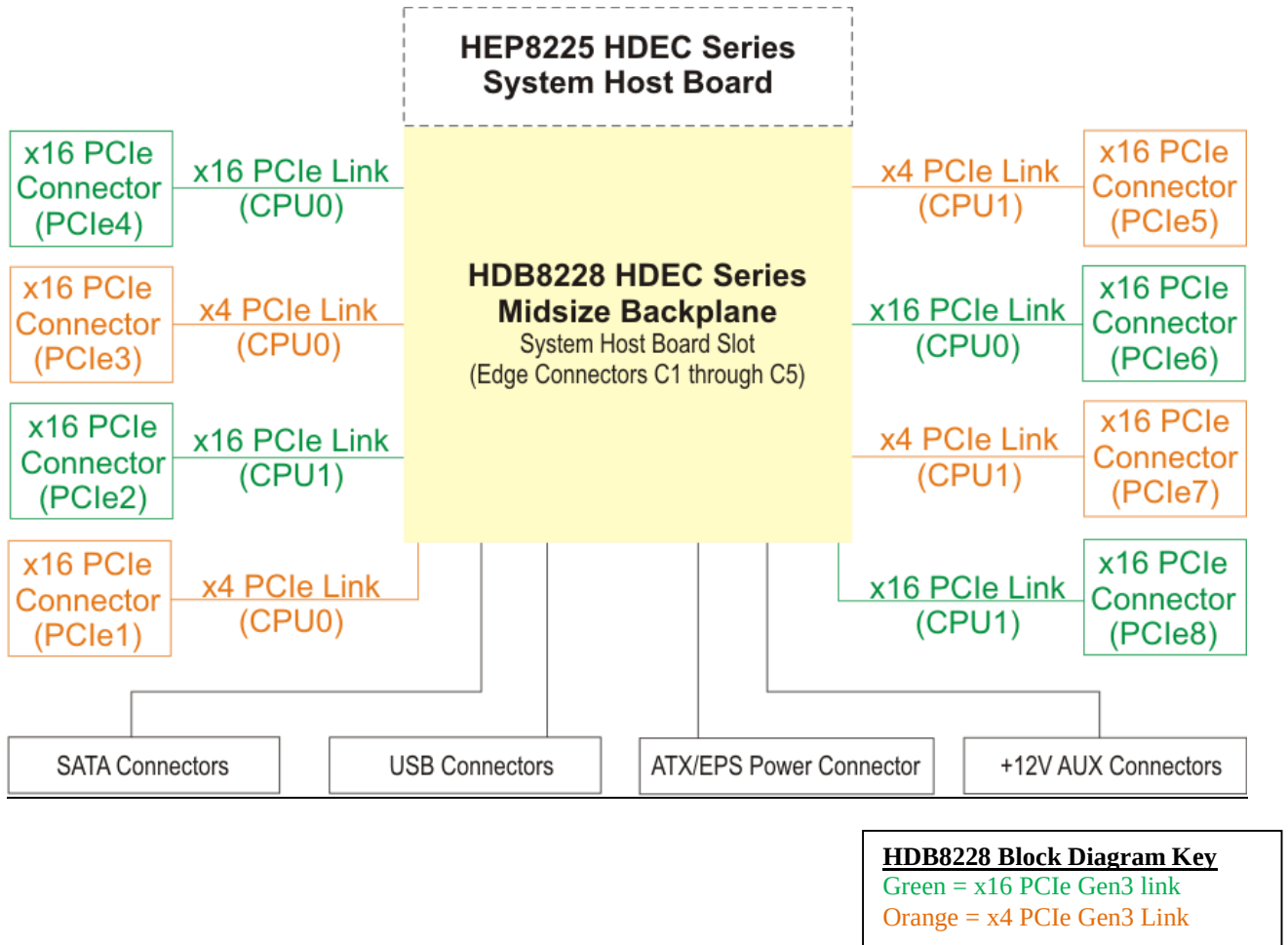


Technical Information –Jumpers, Connectors and Status LEDs

HDB8228 (8228) HDEC Series Midsize Format Backplane

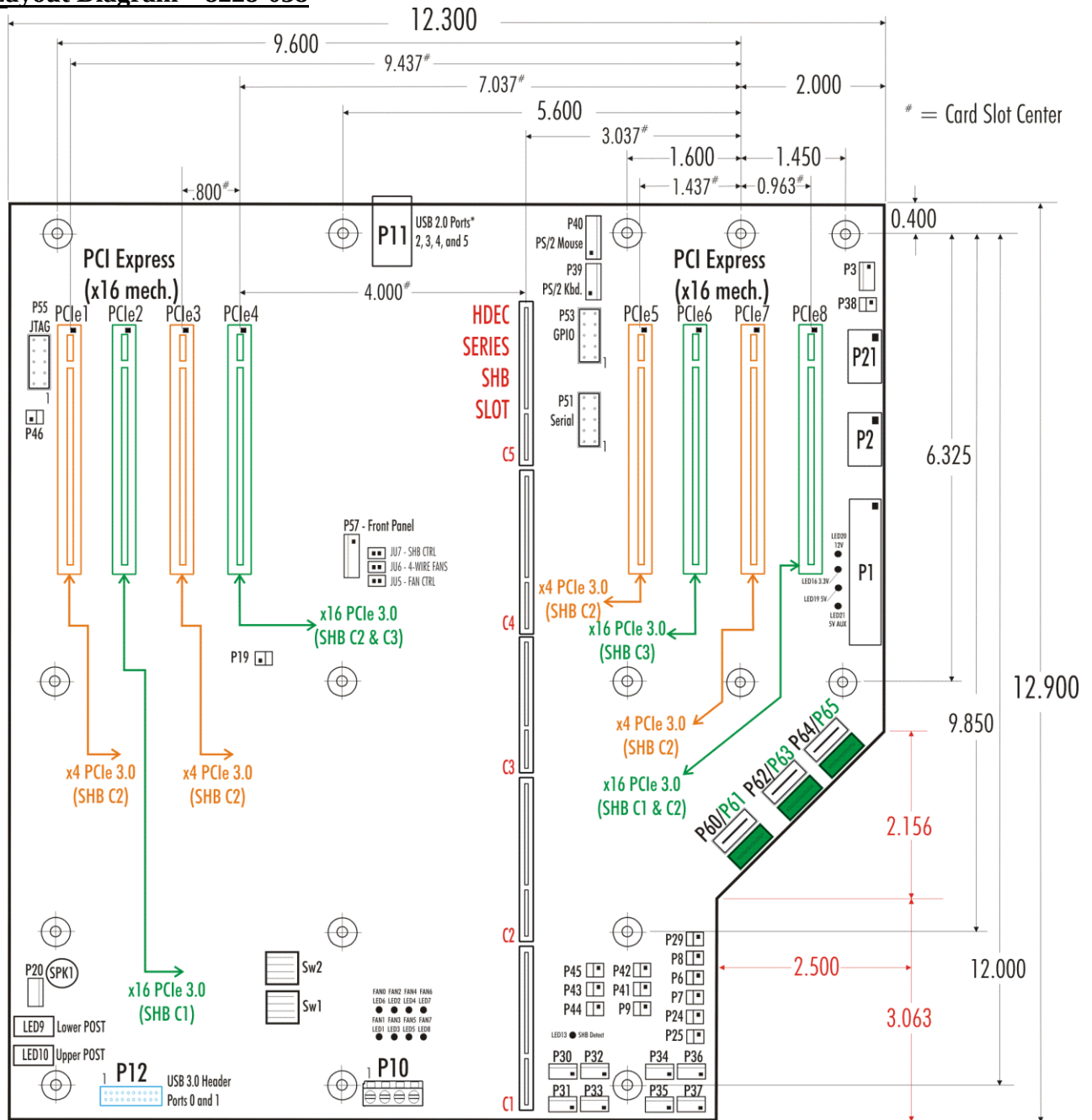
Block Diagram



NOTE: The HDB8228 backplane is optimized for use with HDEC Series SHBs such as the Trenton HEP8225. Native PCI Express 3.0 root links from the HEP8225 processors drive the backplane's eight PCIe option card slots. PCI Express 3.0 link retimers between the processors and the card slots ensure that reliable link communications are established between the CPUs and plug-in cards.

The backplane supports industry standard PCI Express 3.0, 2.0, and 1.1 plug-in cards having x1, x4, x8 or x16 link widths. Plug-in cards having a x16 PCIe electrical link width are only supported at the x16 data throughput rate in HDB8228 backplane slots PCIe2, PCIe4, PCIe6 and PCIe6. Backplane slots PCIe1, PCIe3, PCIe5 and PCIe7 are driven with x4 PCIe 3.0 links. All plug-in card slots use PCI Express x16 mechanical connectors. The HEP8225 processors will auto-negotiate link communication between the CPUs and the plug-in cards to establish a communication link that best matches the plug-in card's specific interface type and link width.

Layout Diagram – 8228-038



Notes:

1. Backplane layout diagram dimensions are in inches.
2. The vertical power connectors shown in the layout diagram represents backplane model number 8228-038.
3. The option card slot connector spacing is 0.800 inches.
4. The nominal backplane thickness is 0.080 inches.
5. Mounting holes have a .156" diameter.
6. USB, SATA, Ethernet connectivity, POST code status and system diagnostics provided by the HEP8225 SHB.
7. Refer to the status LED section for functional definition.

8228-038 Configuration Jumpers

The setup of the configuration jumpers on the backplane is described below.

NOTE: Refer to the backplane layout drawing for the pin 1 position of the jumpers and connectors as indicated by the black square (■).

<u>Jumper</u>	<u>Description</u>								
JU1	Microcontroller Enable (Factory Use Only) 3-pin Jumper, Molex #22-03-2031 Jumper default position is unpopulated <table><tr><td><u>Pin</u></td><td><u>Signal</u></td></tr><tr><td>1</td><td>PERSET#</td></tr><tr><td>2</td><td>MCLR</td></tr><tr><td>3</td><td>Vpp</td></tr></table>	<u>Pin</u>	<u>Signal</u>	1	PERSET#	2	MCLR	3	Vpp
<u>Pin</u>	<u>Signal</u>								
1	PERSET#								
2	MCLR								
3	Vpp								
JU2	PIC Power Select Enable (Factory Use Only) 3-pin Jumper, Molex #22-03-2031 Jumper default position is unpopulated <table><tr><td><u>Pin</u></td><td><u>Signal</u></td></tr><tr><td>1</td><td>+3.3V</td></tr><tr><td>2</td><td>PICPOWER</td></tr><tr><td>3</td><td>Vdd</td></tr></table>	<u>Pin</u>	<u>Signal</u>	1	+3.3V	2	PICPOWER	3	Vdd
<u>Pin</u>	<u>Signal</u>								
1	+3.3V								
2	PICPOWER								
3	Vdd								
JU5	System Fan Control Enable 2-pin Jumper, Tyco (AMP) #5-146280-2 Jumper default position is populated. Remove jumper to have system fans run continuously at full speed. <table><tr><td><u>Pin</u></td><td><u>Signal</u></td></tr><tr><td>1</td><td>+3.3V</td></tr><tr><td>2</td><td>PICPOWER</td></tr></table>	<u>Pin</u>	<u>Signal</u>	1	+3.3V	2	PICPOWER		
<u>Pin</u>	<u>Signal</u>								
1	+3.3V								
2	PICPOWER								
JU6	4-Wire System Fan Enable 2-pin Jumper, Tyco (AMP) #5-146280-2 Jumper default position is populated. Remove jumper for systems that use two or three-wire fans. <table><tr><td><u>Pin</u></td><td><u>Signal</u></td></tr><tr><td>1</td><td>4-wire system fan IN</td></tr><tr><td>2</td><td>Gnd</td></tr></table>	<u>Pin</u>	<u>Signal</u>	1	4-wire system fan IN	2	Gnd		
<u>Pin</u>	<u>Signal</u>								
1	4-wire system fan IN								
2	Gnd								
JU7	SHB Control of System Fans 2-pin Jumper, Tyco (AMP) #5-146280-2 Jumper default position is populated. Remove jumper for systems that system fan control form non-SHB signal sources. <table><tr><td><u>Pin</u></td><td><u>Signal</u></td></tr><tr><td>1</td><td>SHB system fan control IN</td></tr><tr><td>2</td><td>Gnd</td></tr></table>	<u>Pin</u>	<u>Signal</u>	1	SHB system fan control IN	2	Gnd		
<u>Pin</u>	<u>Signal</u>								
1	SHB system fan control IN								
2	Gnd								

8228-038 Configuration Jumpers (continued)

JU8	Backplane Speaker (SPK1) Enable	
	2-pin Jumper, Tyco (AMP) #5-146280-2	
	Jumper default position is unpopulated. Install jumper to enable backplane speaker SPK1. Most systems will use a system speaker connected to P20.	
	<u>Pin</u>	<u>Signal</u>
	1	+5V
	2	SPK1, Pin2
JU9	I2C Card Slot Enable	
	2-pin Jumper, Tyco (AMP) #5-146280-2	
	Jumper default position is unpopulated.	
	<u>Pin</u>	<u>Signal</u>
	1	Enable
	2	GND
JU10	I2C SHB Enable	
	2-pin Jumper, Tyco (AMP) #5-146280-2	
	Jumper default position is unpopulated.	
	<u>Pin</u>	<u>Signal</u>
	1	Enable
	2	GND
JU11	I2C Retimer Enable	
	2-pin Jumper, Tyco (AMP) #5-146280-2	
	Jumper default position is unpopulated.	
	<u>Pin</u>	<u>Signal</u>
	1	Enable
	2	GND

8228-038 Connectors

NOTE: Pin 1 on the connectors is indicated by the square pad on the PCB.

P1 - ATX/EPS Power Connector

24 pin vertical dual row, Molex #44206-0007

<u>Pin</u>	<u>Signal</u>	<u>Pin</u>	<u>Signal</u>
1	+3.3V	13	+3.3V
2	+3.3V	14	NC
3	Gnd	15	Gnd
4	+5V	16	PSON#
5	Gnd	17	Gnd
6	+5V	18	Gnd
7	Gnd	19	Gnd
8	PWRGD	20	NC
9	+5VAUX	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	Gnd

P2, - +12V Power Connectors

P21 Two, 8 pin vertical dual row, Molex #44206-0005

<u>Pin</u>	<u>Signal</u>	<u>Pin</u>	<u>Signal</u>
1	Gnd	8	+12V
2	Gnd	7	+12V
3	Gnd	6	+12V
4	Gnd	5	+12V

P3 - LED Dimmer Connector

4 pin vertical single row header, Molex #47053-1000

<u>Pin</u>	<u>Signal</u>
1	PWM LED
2	PWM LED
3	+12V
4	+12V

8228-038 Connectors (continued)

- P4 - USB 2.0 Redirect Connector (Factory Use Only)**
4 pin vertical single row header, Tyco (AMP) #5-146280-4
- | <u>Pin</u> | <u>Signal</u> |
|------------|---------------|
| 1 | VBUS1 |
| 2 | NC |
| 3 | NC |
| 4 | Gnd |
- P5 - SPI Microcontroller Connector (Factory Use Only)**
4 pin vertical single row header, Tyco (AMP) #5-146280-4
- | <u>Pin</u> | <u>Signal</u> |
|------------|---------------|
| 1 | SPI_DO |
| 2 | SPI_DI |
| 3 | SPI_CLK |
| 4 | SPI_SS |
- P6 - Power-On Connector (PSON)**
2 pin vertical single row header, Tyco (AMP) #640456-2
- | <u>Pin</u> | <u>Signal</u> |
|------------|---------------|
| 1 | Gnd |
| 2 | PSON# |
- P7 - Power Button Connector**
2 pin vertical single row header, Tyco (AMP) #640456-2
- | <u>Pin</u> | <u>Signal</u> |
|------------|---------------|
| 1 | Gnd |
| 2 | PWRBT# |
- P8 - Reset Connector**
2 pin vertical single row header, Tyco (AMP) #640456-2
- | <u>Pin</u> | <u>Signal</u> |
|------------|---------------|
| 1 | Gnd |
| 2 | SHB_RST# |
- P9 - Power Good Connector**
2 pin vertical single row header, Tyco (AMP) #640456-2
- | <u>Pin</u> | <u>Signal</u> |
|------------|---------------|
| 1 | PWRGD |
| 2 | +5V |
- P10 - Terminal Block Connector**
4 position terminal block, Tyco (AMP) #796949-4
20 amps per circuit
- | <u>Pin</u> | <u>Signal</u> |
|------------|---------------|
| 1 | +3.3V |
| 2 | +3.3V |
| 3 | GND |
| 4 | GND |

8228-038 Connectors (continued)

P11 - Stacked, Quad USB 3.0 Ports (Rear Chassis Access)

4-port USB connector, FOXCONN #UEA1112C-QHD6-4F

Note 1: The A connector is the lowest connector in the stack while the D connector is the upper connector.

Note 2: The backplane routes USB 2.0 interfaces from the HEP8225 system host board to these four USB ports.

<u>Pin</u>	<u>Signal</u>	<u>Pin</u>	<u>Signal</u>
A1	+5V-USB2	B1	+5V-USB3
A2	USB2_N	B2	USB3_N
A3	USB2_P	B3	USB3_P
A4	Gnd-USB2	B4	Gnd-USB3
A5	USB2SSRX_N	B5	USB3SSRX_N
A6	USB2SSRX_P	B6	USB3SSRX_P
A7	Gnd-USB2	B7	Gnd-USB3
A8	USB2SSTX_N	B8	USB3SSTX_N
A9	USB2SSTX_P	B9	USB3SSTX_P

<u>Pin</u>	<u>Signal</u>	<u>Pin</u>	<u>Signal</u>
C1	+5V-USB4	D1	+5V-USB5
C2	USB4_N	D2	USB5_N
C3	USB4_P	D3	USB5_P
C4	Gnd-USB4	D4	Gnd-USB5
C5	USB4SSRX_N	D5	USB5SSRX_N
C6	USB4SSRX_P	D6	USB5SSRX_P
C7	Gnd-USB4	D7	Gnd-USB5
C8	USB4SSTX_N	D8	USB5SSTX_N
C9	USB4SSTX_P	D9	USB5SSTX_P

P12 - Universal Serial Bus 3.0 (USB) Connector

19 pin dual row header, LOTES #ABA-USB-050-K04

<u>Pin</u>	<u>Signal</u>	<u>Pin</u>	<u>Signal</u>
1	+5V-USB4 (VBUS1)	11	USB5-DP
2	USB4-SRXN	12	USB5-DN
3	USB4-SRXP	13	Gnd-USB5
4	Gnd-USB4	14	USB5-STXP
5	USB4-STXN	15	USB5-STXN
6	USB4-STXP	16	Gnd-USB5
7	Gnd-USB4	17	USB5-SRXP
8	USB4-DN	18	USB5-SRXN
9	USB4-DP	19	+5V-USB5 (VBUS19)
10	NC		

P19 - I2C Slot Header (Factory Use Only)

3 pin single row header, Molex #22-23-2031

<u>Pin</u>	<u>Signal</u>
1	I2C_Header_SDA
2	I2C_Header_SCL
3	Gnd

8228-038 Connectors (continued)

P20 - System Speaker Connector

4 pin single row header, Molex #47053-1000

<u>Pin</u>	<u>Signal</u>
1	SPKR_n
2	NC
3	Gnd
4	+5V

P24 - Temperature Sensor 0 Connector

2 pin single row header, Tyco (AMP) #640456-2

<u>Pin</u>	<u>Signal</u>
1	Gnd
2	TEMPSENSE0

P25 - Temperature Sensor 1 Connector

2 pin single row header, Tyco (AMP) #640456-2

<u>Pin</u>	<u>Signal</u>
1	Gnd
2	TEMPSENSE1

P29 - Clear CMOS Connector

2 pin single row header, Tyco (AMP) #640456-2

<u>Pin</u>	<u>Signal</u>
1	Gnd
2	CMOSCLR#

NOTE: To clear the system host board's CMOS using backplane connector P29, power down the system and install the P29 jumper. Wait for at least two seconds, remove the jumper and turn the power on. Clearing CMOS on the System host board will not result in a checksum error on the following boot. If you want to change a BIOS setting, you must press DEL or the F2 key during POST to enter the SHB's BIOS setup after clearing CMOS.

NOTE 2: Backplane Clear CMOS capability is a planned capability for the HDEC specification, to be implemented on future SHB products. The HEP8225 SHB does not support this capability.
For full P29 connector support information, contact Trenton.

P30, 12V Chassis Fan Connectors (8)

P31, 4 pin right-angle header, Molex #47053-1000

P32,	<u>Pin</u>	<u>Signal</u>
P33,	1	PWMn_3W (n = 0, 1, 2, 3, 4, 5, 6, or 7)
P34,	2	+12V
P35,	3	TACHn
P36,	4	PWMn_4W
P37	Note: 0=P30, 1=P31, 2=P32, 3=P33, 4=P34, 5=P35, 6=P36, 7=P37	

P38 - Intruder Alert Connector

2 pin single row header, Tyco (AMP) #640456-2

<u>Pin</u>	<u>Signal</u>
1	Gnd
2	INTRUDER#

8228-038 Connectors (continued)**P39 - PS/2 Keyboard Connector**

5 pin single row header, Tyco (AMP) # 640456-5

<u>Pin</u>	<u>Signal</u>
1	PS2KBDCLK
2	PS2KBDDAT
3	NC
4	Gnd
5	+5V

P40 - PS/2 Mouse Connector

6 pin single row header, Tyco (AMP) # 640456-6

<u>Pin</u>	<u>Signal</u>
1	PS2MSDAT
2	NC
3	Gnd
4	+5V
5	PS2MSCLK
6	NC

P41 - Fan Alarm LED Connector

2 pin single row header, Tyco (AMP) #640456-2

<u>Pin</u>	<u>Signal</u>
1	FF_LED
2	+5V

P42 - Temp Alarm LED Connector

2 pin single row header, Tyco (AMP) #640456-2

<u>Pin</u>	<u>Signal</u>
1	TEMP_LED
2	+5V

P43 - Voltage Alarm LED Connector

2 pin single row header, Tyco (AMP) #640456-2

<u>Pin</u>	<u>Signal</u>
1	VOLT_LED
2	+5V

P44 - Error Alarm LED Connector

2 pin single row header, Tyco (AMP) #640456-2

<u>Pin</u>	<u>Signal</u>
1	ERROR_LED
2	+5V

P45 - HDD LED Connector

2 pin single row header, Tyco (AMP) #640456-2

<u>Pin</u>	<u>Signal</u>
1	HDD_LED
2	+5V

8228-038 Connectors (continued)

P46 - 3.3V AUX Card Slot Enable Connector

2 pin single row header, Tyco (AMP) #640456-2

<u>Pin</u>	<u>Signal</u>
1	3.3V_AUX
2	+3.3V

Installing jumper P46 enables +3.3V AUX
on all the PCIe card slots

P47 - I2C Card Slot Disable Connector

2 pin single row header, Tyco (AMP) #640456-2

<u>Pin</u>	<u>Signal</u>
1	I2C Enable
2	Gnd

Installing jumper P47 disables the I2C
signals on all the PCIe card slots

P48 - Ethernet Activity LED Connector

2 pin single row header, Tyco (AMP) #640456-2

<u>Pin</u>	<u>Signal</u>
1	ENET0LED1
2	ENET0LED0

P49 - Ethernet Activity LED Connector

2 pin single row header, Tyco (AMP) #640456-2

<u>Pin</u>	<u>Signal</u>
1	ENET1LED1
2	ENET1LED0

P50 - Micro-Controller Programing Port (Factory Use Only)

5 pin single row header, Tyco (AMP) #87224-5

<u>Pin</u>	<u>Signal</u>
1	Vpp
2	Vdd
3	Gnd
4	ICSPDAT
5	ICSPCLK

P51 - RS232 Serial Port Connector

10 pin dual row connector, 3M #N2510-6003-RB

<u>Pin</u>	<u>Signal</u>	<u>Pin</u>	<u>Signal</u>
1	Carrier Detect (DCD)	2	Data Set Ready-I (DSR)
3	Receive Data-I (RX)	4	Request to Sent-O (RTS)
5	Transmit Data-O (TX)	6	Clear To Send (CTS)
7	Data Terminal Ready (DTR)	8	Ring Indicator-I (RI)
9	Gnd	10	NC

8228-038 Connectors (continued)

P53 - GPIO Connector

8 pin dual row connector, 3M #N2508-6003-RB

<u>Pin</u>	<u>Signal</u>	<u>Pin</u>	<u>Signal</u>
1	GPIO2	2	GPIO3
3	GPIO4	4	GPIO5
5	GPIO6	6	GPIO7
7	GPIO1	8	Gnd

P55 - JTAG Connector

10 pin dual row connector, 3M #N2510-6003-RB

<u>Pin</u>	<u>Signal</u>	<u>Pin</u>	<u>Signal</u>
1	TCK	2	Gnd
3	TDOHDR	4	+3.3V
5	TMS	6	RESET#
7	EVTO	8	TRST#
9	TDOPCIE8	10	NC

P57 - Front or Rear Panel LED/Button Connector (Factory Use Only)

7 pin single row header, Tyco (AMP) # 640456-7

<u>Pin</u>	<u>Signal</u>
1	Common from panel
2	Button position 1
3	Button position 2
4	Button position 3
5	Button position 4
6	Button position 5
7	Button position 6

P60, SATA Connectors (6)

P61, 7 pin vertical connector with latch, Molex # 67800-8005

P62, P60 = Backplane SATA0, P61 = Backplane SATA1

P63, P62 = Backplane SATA2, P63 = Backplane SATA3

P64, P64 = Backplane SATA4, P65 = Backplane SATA5

P65 Pin Signal

1	Gnd
2	TXn_p
3	TXn_n
4	Gnd
5	RXn_p
6	RXn_n
7	Gnd

n = 0, 1, 2, 3, 4 or 5

8228-038 Diagnostic LED Status Indicators

LED Reference Designation	Backplane Silkscreen Wording	LED On	LED Off
LED1 thru LED8 (Green)	FAN0 thru FAN7	System fan present	System fan not present
LED9 (7-segment display)	Upper Post Code	SHB Post Code Error*	SHB Boot Complete
LED10 (7-segment display)	Lower Post Code	SHB Post Code Error*	SHB Boot Complete
LED11 (Green)	1V	Acceptable voltage level	Voltage level not acceptable
LED12 (Green)	1.8V	Acceptable voltage level	Voltage level not acceptable
LED13 (Red)	SHB Detect	SHB is not properly seated in its socket	Normal operation – SHB Detected
LED16 (Green)	3.3V	Acceptable voltage level	Voltage level not acceptable
LED19 (Green)	5V	Acceptable voltage level	Voltage level not acceptable
LED20 (Green)	12V	Acceptable voltage level	Voltage level not acceptable
LED21 (Green)	5V AUX	Acceptable voltage level	Voltage level not acceptable

*See the HEP8225 hardware reference manual for a description of the SHB's post code error code numbers