TRENTON Systems, Inc.
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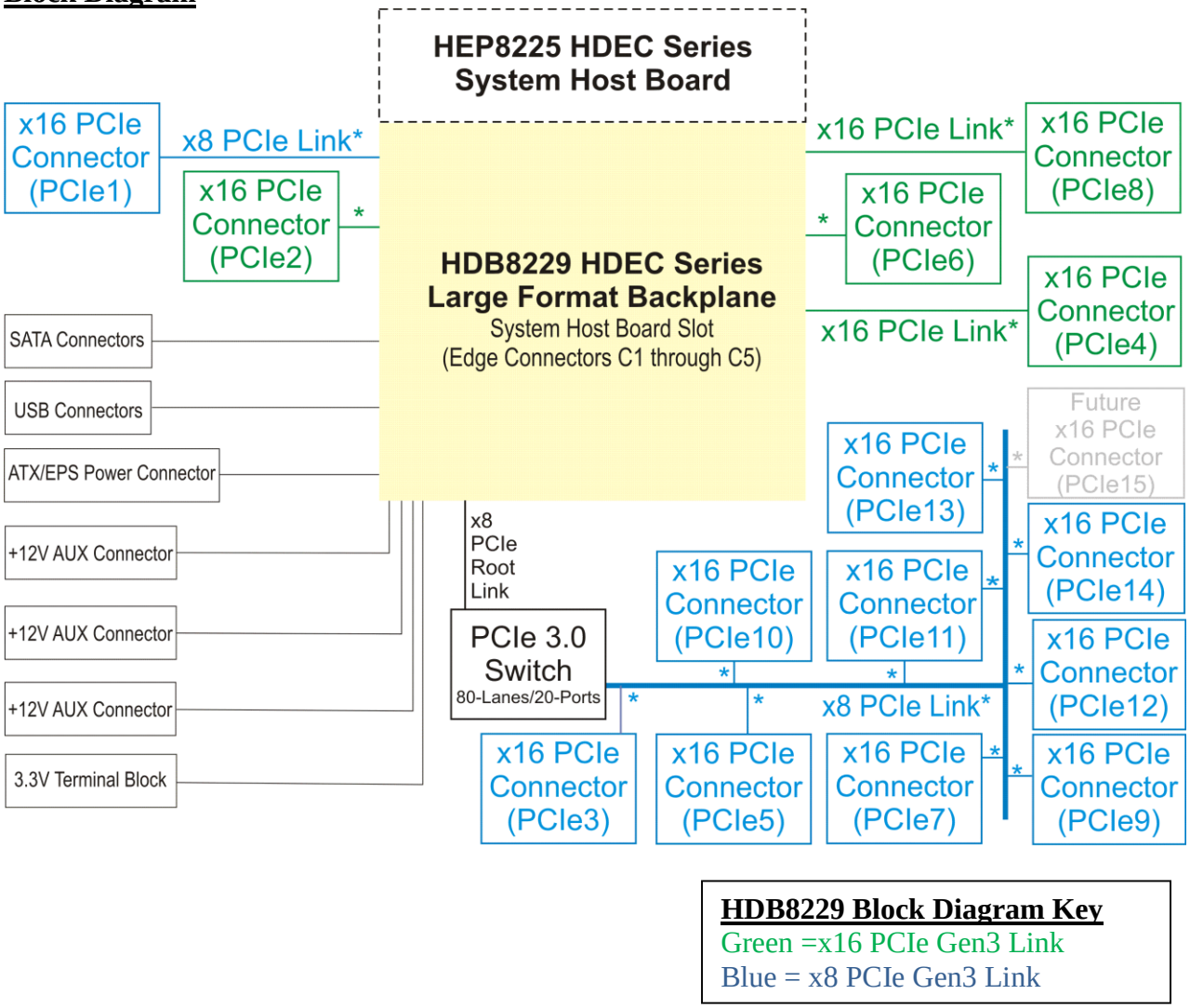
Technical Information – Jumpers, Connectors and Status LEDs
HDB8229 (8229) HDEC Series Large Format Backplane

Block Diagram



HDB8229 Block Diagram Key
Green =x16 PCIe Gen3 Link
Blue = x8 PCIe Gen3 Link

NOTE: The HDB8229 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 card slot connectors. PCI Express 3.0 link retimers between the processors and the card slots ensure that reliable link communications are established between the CPUs and any 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 are only supported at the x16 data throughput rate in backplane slots PCIe2, PCIe4, PCIe6 and PCIe8. The HEP8225 processors auto-negotiate link speeds between the CPUs and the cards to establish a link that best matches the plug-in card's specific interface type and width.

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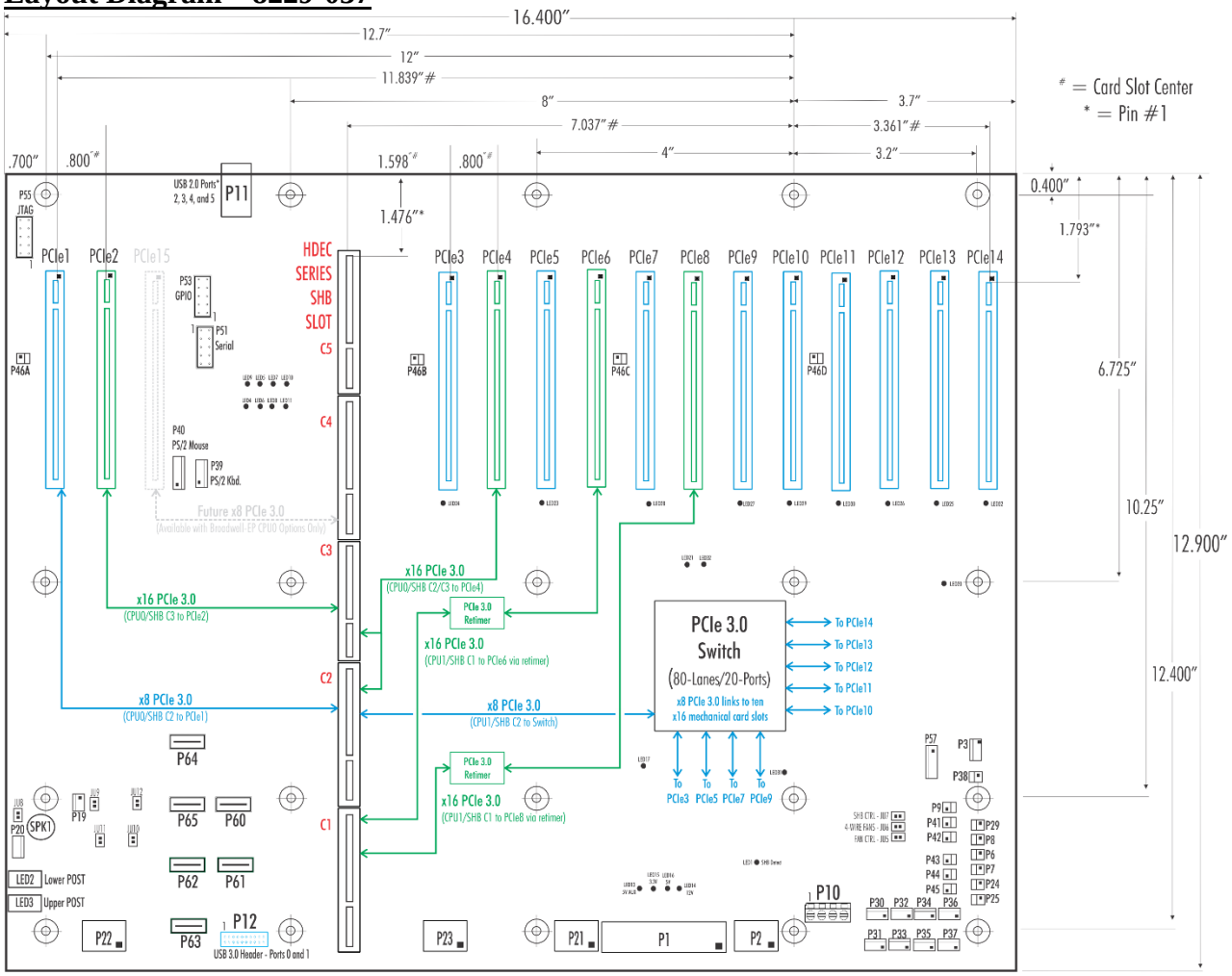
Layout Diagram – 8229-037



Notes:

1. Backplane layout diagram dimensions are in inches.
2. The right-angle power connectors shown in the layout diagram represent backplane model 8229-037.
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 0.156” diameter.
6. USB, SATA, Ethernet connectivity, POST code status and system diagnostics are provided by the HEP8225 SHB.
7. Refer to the status LED section for functional definition.

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8229-037 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 (▪).

Jumper	Description
JU1	**Microcontroller Enable** (Factory Use Only) 3-pin Jumper, Molex #22-03-2031 Jumper default position is unpopulated Pin Signal 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 Pin Signal 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. Pin Signal 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. Pin Signal 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 where system fan control is from non-SHB signal sources. Pin Signal 1 SHB system fan control IN 2 Gnd

JU8 **Backplane Speaker (SPK1) Enable**

2-pin Jumper, Tyco (AMP) #5-146280-2
Jumper default position is populated. Remove jumper to disable backplane speaker SPK1. Most systems will use a system speaker connected to P20.

Pin	Signal
1	+5V
2	SPK1, Pin2

JU9 **I2C Retimer Disable Connector**

2 pin single row header, Tyco (AMP) #640456-2
Installing jumper JU9 disables the PCIe slots.

Pin	Signal
1	I2C Enable
2	Gnd

JU10 **I2C Retimer Disable Connector**

2 pin single row header, Tyco (AMP) #640456-2
Installing jumper JU10 disables the SHB/HDEC port.

Pin	Signal
1	I2C Enable
2	Gnd

JU11 **I2C Retimer Disable Connector**

2 pin single row header, Tyco (AMP) #640456-2
Installing jumper JU11 disables the PCIe retimers.

Pin	Signal
1	I2C Enable
2	Gnd

JU12 **I2C Disable PEX Switch**

2 pin single row header, Tyco (AMP) #640456-2
Installing jumper P49 disables the PCIe switch.

Pin	Signal
1	I2C Enable
2	Gnd

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8229-037 Connectors

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

P1 **ATX/EPS Power Connector**

24 pin right angle dual row, Molex #39-30-1240

Pin	Signal	Pin	Signal
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**

8 pin right angle dual row, Molex #39-30-0080

Pin	Signal	Pin	Signal
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

Pin	Signal
1	PWM LED
2	PWM LED
3	+12V
4	+12V

P5 **SPI Microcontroller Connector (Factory Use Only)**

4 pin vertical single row header, Tyco (AMP) #5-146280-4

Pin	Signal
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

Pin	Signal
1	Gnd
2	PSON#

P7 Power Button Connector

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

Pin	Signal
1	Gnd
2	PWRBT#

P8 Reset Connector

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

Pin	Signal
1	Gnd
2	SHB_RST#

P9 Power Good Connector

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

Pin	Signal
1	PWRGD
2	+5V

P10 Terminal Block Connector

4 position terminal block, Tyco (AMP) #796949-4 (20 Amps per circuit)

Pin	Signal
1	+3.3V
2	+3.3V
3	GND
4	GND

P11 Stacked, Quad USB 2.0 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.

Pin	Signal	Pin	Signal
A1	+5V-USB2	B1	+5V-USB3
A2	USB2_N	B2	USB3_N
A3	USB2_P Gnd-	B3	USB3_P Gnd-
A4	USB2	B4	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
Pin	**Signal**	**Pin**	**Signal**
B1	+5V-USB4	D1	+5V-USB5
B2	USB4_N	D2	USB5_N
B3	USB4_P Gnd-	D3	USB5_P Gnd-
B4	USB4	D4	USB5
B5	USB4SSRX_N	D5	USB5SSRX_N
B6	USB4SSRX_P	D6	USB5SSRX_P
B7	Gnd-USB4	D7	Gnd_USB5
B8	USB4SSTX_N	D8	USB5SSTX_N
B9	USB4SSTX_P	D9	USB5SSTX_P

P12 Universal Serial Bus 3.0 (USB) Connector

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

Pin	Signal	Pin	Signal
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		

P15 GPIO Debug Header (Factory Use Only)

4 pin vertical single row header, Tyco (AMP) #5-146280-4

Pin	Signal
1	GPIO_1
2	GPIO_2
3	GPIO_3
4	GPIO_4

P19 I2C Slot Header (Factory Use Only)

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

Pin	Signal
1	I2C_Header_SDA
2	I2C_Header_SCL
3	Gnd

P20 System Speaker Connector

4 pin single row header, Molex #47053-1000

Pin	Signal
1	SPKR_n
2	NC
3	Gnd
4	+5V

P21 +12V Power Connector

8 pin right angle dual row, Molex #39-30-0080

Pin	Signal	Pin	Signal
1	Gnd	8	+12V
2	Gnd	7	+12V
3	Gnd	6	+12V
4	Gnd	5	+12V

P22 +12V Power Connector

8 pin right angle dual row, Molex #39-30-0080

Pin	Signal	Pin	Signal
1	Gnd	8	+12V
2	Gnd	7	+12V
3	Gnd	6	+12V
4	Gnd	5	+12V

P23 +12V Power Connector

8 pin right angle dual row, Molex #39-30-0080

Pin	Signal	Pin	Signal
1	Gnd	8	+12V
2	Gnd	7	+12V
3	Gnd	6	+12V
4	Gnd	5	+12V

P24 Temperature Sensor 0 Connector

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

Pin	Signal
1	Gnd
2	TEMPSENSE0

P25 Temperature Sensor 1 Connector

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

Pin	Signal
1	Gnd
2	TEMPSENSE1

P29 Clear CMOS Connector

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

Pin	Signal
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, P31, P32, P33, P34, P35, P36, P37
12V Chassis Fan Connectors (4)

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

Pin	Signal
1	PWMn_3W
2	+12V
3	TACHn
4	PWMn_4W

Note: n=Fan Number

P38 Intruder Alert Connector

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

Pin	Signal
1	Gnd
2	INTRUDER#

P39 PS/2 Keyboard Connector

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

Pin	Signal
1	PS2KBDCLK
2	PS2KBDDAT
3	NC
4	Gnd
5	+5V

P40 PS/2 Mouse Connector

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

Pin	Signal
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

Pin	Signal
1	FF_LED
2	+5V

P42 Temp Alarm LED Connector

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

Pin	Signal
1	TEMP_LED
2	+5V

P43 Voltage Alarm LED Connector

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

Pin	Signal
1	VOLT_LED
2	+5V

P44 Error Alarm LED Connector

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

Pin	Signal
1	ERROR_LED
2	+5V

P45 HDD LED Connector

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

Pin	Signal
1	HDD_LED
2	+5V

P46 **3.3V AUX Card Slot Enable Connector**

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

C, D

Pin	Signal
1	3.3V_AUX
2	+3.3V

Note 1: Installing jumper P46n enables +3.3V AUX on four of the PCIe card slots for boards with only one connector.

Note 2: For boards with multiple connectors, enabling will provide +3.3V AUX to only those slots the specific jumper controls.

P51 **RS232 Serial Port Connector**

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

Pin	Signal	Pin	Signal
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

P53 **GPIO Connector**

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

Pin	Signal	Pin	Signal
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

Pin	Signal	Pin	Signal
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

Pin	Signal
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, P61, P62, P63, P64, P65 SATA Connectors

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

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

Note: n=SATA port number

8229-037 Diagnostic LED Status Indicators

LED Reference Designation	Backplane Silkscreen Wording	LED On	LED Off
LED1 (Red)	SHB Detect	SHB is not properly seated in its socket	Normal operation – SHB Detected
LED2 (7-segment display)	Lower Post Code	SHB Post Code Error*	SHB Boot Complete
LED3 (7-segment display)	Upper Post Code	SHB Post Code Error*	SHB Boot Complete
LED4,5,6,7,8,9,10,11	FAN n (n=System Fan Number)	System fan present	System fan not present
LED12	PWRGOOD	Acceptable voltage level	Voltage level not acceptable
LED13	+5V AUX	Acceptable voltage level	Voltage level not acceptable
LED14	+12V	Acceptable voltage level	Voltage level not acceptable
LED15	+5V	Acceptable voltage level	Voltage level not acceptable
LED16	+3.3V	Acceptable voltage level	Voltage level not acceptable
LED17	+1.8V for U10, U20, U40	Acceptable voltage level	Voltage level not acceptable
LED18	+1.8V for U21	Acceptable voltage level	Voltage level not acceptable
LED20	+0.9V	Acceptable voltage level	Voltage level not acceptable
LED21	Port Good 0	PCIe Port Functional	PCIe Port NonFunctional
LED22	Port Good 1	PCIe Port Functional	PCIe Port NonFunctional
LED23	Port Good 4	PCIe Port Functional	PCIe Port NonFunctional
LED24	Port Good 5	PCIe Port Functional	PCIe Port NonFunctional
LED25	Port Good 8	PCIe Port Functional	PCIe Port NonFunctional
LED26	Port Good 9	PCIe Port Functional	PCIe Port NonFunctional
LED27	Port Good 12	PCIe Port Functional	PCIe Port NonFunctional
LED28	Port Good 13	PCIe Port Functional	PCIe Port NonFunctional
LED29	Port Good 17	PCIe Port Functional	PCIe Port NonFunctional
LED30	Port Good 16	PCIe Port Functional	PCIe Port NonFunctional
LED31	EEPROM	EEPROM Not Programmed	EEPROM Programmed
LED32	U30 Fatal	PCIe Switch Fail	PCIe Switch Operational

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