TRENTON Systems, Inc.
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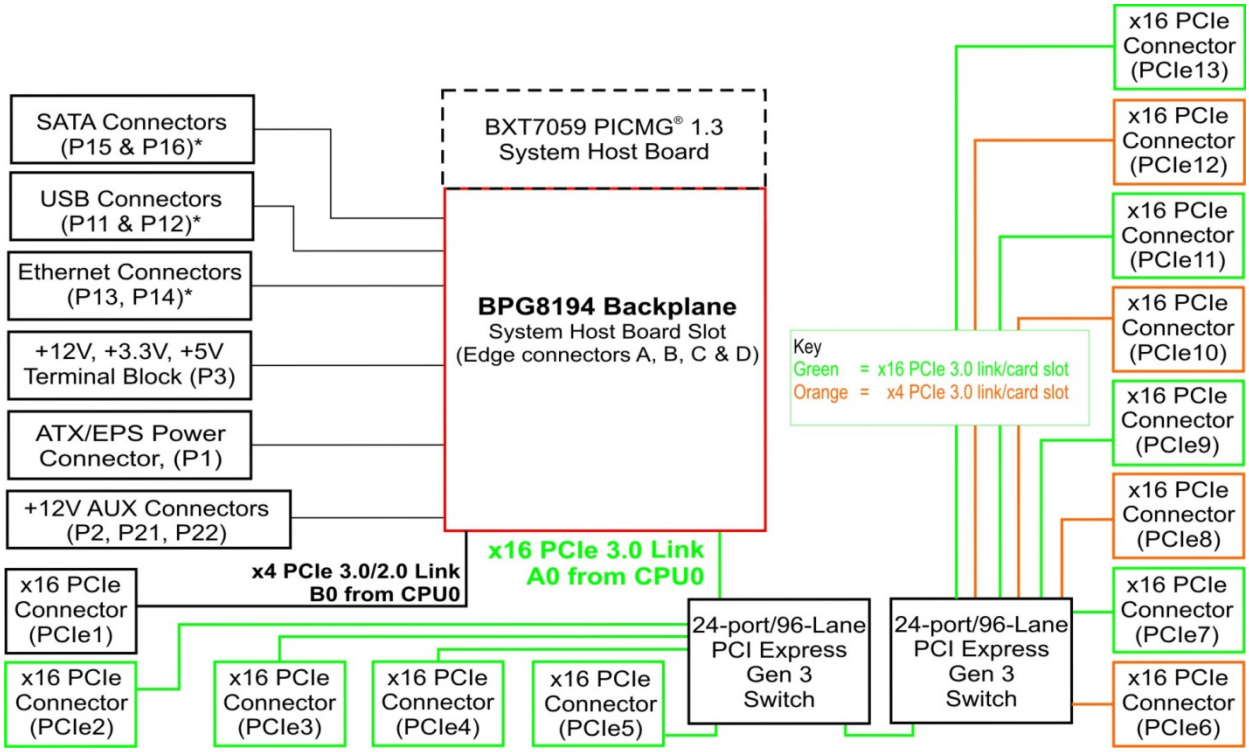
Technical Information –Jumpers, Connectors and Status LEDs
BPG8194 (8194) Large Form Factor PCI Express 3.0 Backplane

Block Diagram



The SHB slot on the BPG8194 backplane supports any standard PICMG® 1.3 system host board. The backplane's PCI Express® interfaces were designed and manufactured using proper link routing techniques optimized for PCI Express Gen3 interfaces. The BPG8194 link design ensures maximum link speeds and data throughput between the system host board and standard PCIe plug-in cards regardless of the backplane slot distance from the system host board.

Trenton's dual-processor BXT7059 system host board and the single processor THD8141 and BXTS7059 SHBs all feature a PCIe Gen3 root link. This means that the entire link from the originating point in the SHB's processor, out to any fully compliant PCIe Gen3 plug-in card installed in a BPG8194 backplane slot will operate at the PCIe 3.0 link speed. If a non-compliant Gen3 card is used; or if there's a technical issue with a particular card, then the Gen3 link may train down to a Gen2 or Gen1.1 link speed.

Non-Gen3 system host boards such as the Trenton JXT6966, JXTS6966, TSB7053 and TQ9 are also supported on the BPG8194 backplane. However, for these PCIe Gen2 SHBs the PCIe root link to the first PCIe Gen3 switch will operate at a PCIe 2.0 link speed. It's important to note that regardless of which SHB is used all downstream links from the initial PCIe Gen3 switch will operate at the PCIe 3.0 link speeds when Gen3 cards (i.e. endpoints) are installed in backplane option card slots PCIe2 through PCIe13. If non-Gen3 option cards are installed in the backplane slots, then those slots will train down to the PCI Express link speed supported by the particular option card.

The PCIe1 card slot is driven directly from the B0 link generated on the system host board. This slot may operate as a Gen3, Gen2, or Gen1.1 PCIe x4 link depending on the SHB used and the card type installed in the PCIe1 backplane slot.

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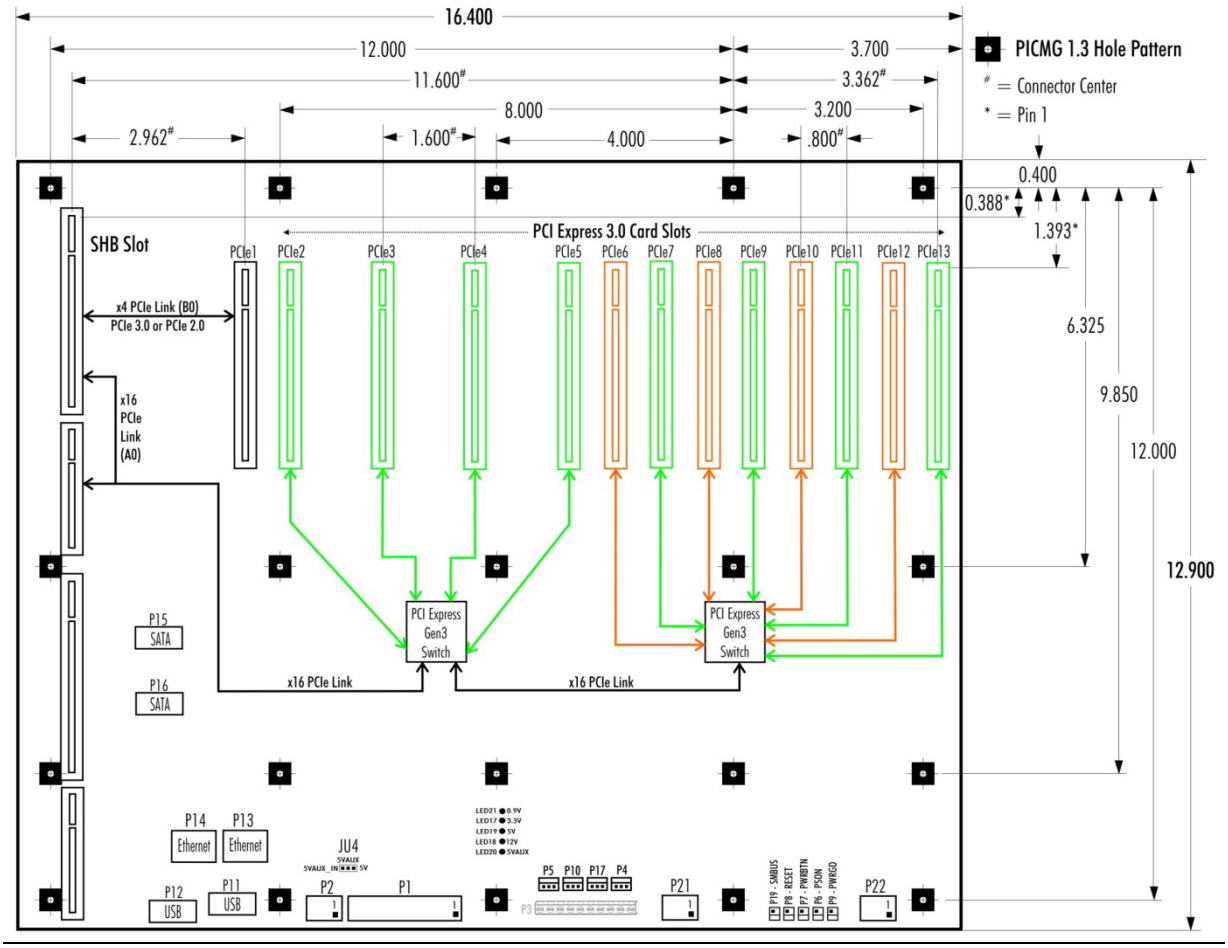
Layout Diagram – 8194-009 – Dimension Drawing



Notes:

1. Connector spacing: 0.800”
2. Power connectors shown represents backplane model number 8150-009 [right-angle power connectors with terminal block P7 unpopulated]
3. The nominal backplane thickness is 0.080”; however, the backplane mounting holes are recessed 0.018” on the bottom to provide an effective PCB thickness of 0.062” for use in the chassis design process.
4. Mounting holes: .156” diameter
5. All dimensions are in inches.
6. Optional PICMG 1.3 USB, SATA, and Ethernet connectivity provided by Trenton PICMG 1.3 SHBs. Not all SHBs support these capabilities.
7. Refer to the status LED section for definitions on the PCI Express link speed and state for each diagnostic LED

Configuration Jumpers

The setup of the configuration jumpers on the backplane is described below. An * indicates the jumper default value.

NOTE: For the JU4 3-pin / two-position jumper, "LEFT" refers to positioning of the two jumper pins that are closest to the system host board (SHB) slot.

Jumper	Description
JU4	**+5V Auxiliary Voltage** (3-pin Jumper/Two Position) Install on the LEFT (pins 2-3) if the +5V auxiliary voltage is provided by a separate +5VAUX signal input pin. This enables the necessary SHB power signaling and allows recovery from sleep mode. This option is used for ATX or EPS standard power supplies. * Install on the RIGHT (pins 1-2) if the +5V auxiliary voltage is provided by the standard +5V supply. This option is used for systems which do not have either an ATX or EPS standard power input. This mode provides the necessary +5V for the SHB's +5VAUX signal lines. Sleep mode recovery is not supported using non- ATX/EPS power supplies.

***Default position**

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8194 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, P21, P22 - +12V AUX 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

P3 - Terminal Block Connector
(backplane tabs -007 amd -008 only)
10 position terminal block, Phoenix Contact #19 35 24 2
20 amps per circuit

Pin	Signal	Pin	Signal
1	+12V	6	Gnd
2	+12V	7	Gnd
3	+5V	8	Gnd
4	+3.3V	9	Gnd
5	+3.3V	10	Gnd

P4, P5, P10, P17 - 12V Chassis Fan Connectors
3 pin right-angle header, Molex # 22-05-3031

Pin	Signal
1	Gnd
2	+12V
3	NC

P6 - Power-On Connector
2 pin vertical single row header, Amp #640456-2

Pin	Signal
1	PSON#
2	Gnd

8194 Connectors (continued)

P7 - Power Button Connector
2 pin vertical single row header,
Amp #640456-2

Pin	Signal
1	PWRBT#
2	Gnd

P8 - Reset Connector
2 pin vertical single row header, Amp #640456-2

Pin	Signal
1	SHB_RST#
2	Gnd

P9 - Power Good Connector
2 pin vertical single row header,
Amp #640456-2

Pin	Signal
1	PWRGD
2	+5V

P11 - Universal Serial Bus (USB) Connector[#]
8 pin dual row header, Amp #5103308-1

Pin	Signal	Pin	Signal
1	+5V-USB1	2	+5V-USB0
3	USB1-	4	USB0-
5	USB1+	6	USB0+
7	Gnd-USB1	8	Gnd-USB0

P12 - Universal Serial Bus (USB) Connector[#]
10 pin dual row, right-angle header, Amp #5103310-1

Pin	Signal	Pin	Signal
1	+5V-USB3	2	+5V-USB2
3	USB3-	4	USB2-
5	USB3+	6	USB2+
7	Gnd-USB3	8	Gnd-USB2
9	NC	10	NC

P13, P14 - 10/100/1000Base-T Ethernet Connectors (2) – LAN 0, LAN1[#]
8 pin vertical RJ-45 connector, Molex #42878-8410

Pin	Signal
1	TRP1+
2	TRP1-
3	TRP2+
4	TRP3+
5	TRP3-
6	TRP2-
7	TRP4+
8	TRP4-

8194 Connectors (continued)

P15, P16 — **SATA Connectors (2)**[#]
7 pin vertical connector with latch, Molex # 67800-8005

Pin	Signal
1	Gnd
2	TX0_p
3	TX0_n
4	Gnd
5	RX0_p
6	RX0_n
7	Gnd

P19 - SMBUS Connector
2 pin vertical single row header, Amp #640456-2

Pin	Signal
1	SMDAT
2	SMCLK

P30, P50 — **PCIe Switch Cooling Fan Connectors**
3 pin right-angle header, Molex # 22-05-3031

Pin	Signal
1	Gnd
2	+12V
3	NC

[#]Backplane functionality provided by the system host board

8194 Diagnostic LED Status – Power Indicators

LED Reference Designation	Backplane Silkscreen Wording	LED On	LED Off
LED17	3.3V	Voltage Detected	Voltage Not Detected
LED18	12V	Voltage Detected	Voltage Not Detected
LED19	5V	Voltage Detected	Voltage Not Detected
LED20	5V AUX	Voltage Detected	Voltage Not Detected
LED21	0.9V	Voltage Detected	Voltage Not Detected

8194 Diagnostic LED Functions – PCI Express Links

LED Reference Designation	Backplane Silkscreen Wording	Function
LED1	PROG	U50 EEPROM status LED
LED2	ERROR	Programming error for the EEPROM values used by PCIe Switch U50
LED3	PROG	U30 EEPROM status LED
LED4	ERROR	Programming error for the EEPROM values used by PCIe Switch U30
LED6	A0 UPSTREAM LINK	Indicates A0 PCIe x16 link established between the SHB and PCIe Switch U30

8194 Diagnostic LEDs for PCI Express Link Status and Speed to the PCIe Option Card Slots

LED Pattern	PCI Express Link State
OFF	Link down
ON	Link is up and running at PCIe Gen3 speed (8.0GT/s)
Blinking, 0.25 sec. ON, 0.25 sec. OFF	Link is up and running at PCIe Gen2 speed (5.0GT/s)
Blinking, 0.5 sec. ON, 0.5 sec. OFF	Link is up and running at PCIe Gen1.1 speed (2.5GT/s)
LED Indicator	**Option Card Slot/Maximum PCIe Link Width**
LED5	PCIe2/x16
LED9	PCIe3/x16
LED8	PCIe4/x16
LED10	PCIe5/x16
LED25	PCIe6/x4
LED11	PCIe7/16
LED22	PCIe8/x4
LED16	PCIe9/x16
LED24	PCIe10/x4
LED15	PCIe11/x16
LED14	PCIe12/x4
LED12	PCIe13/x16