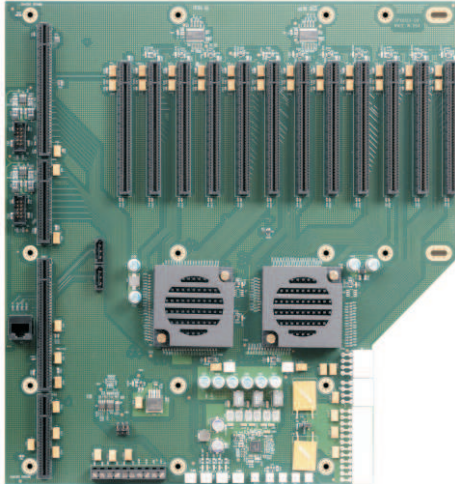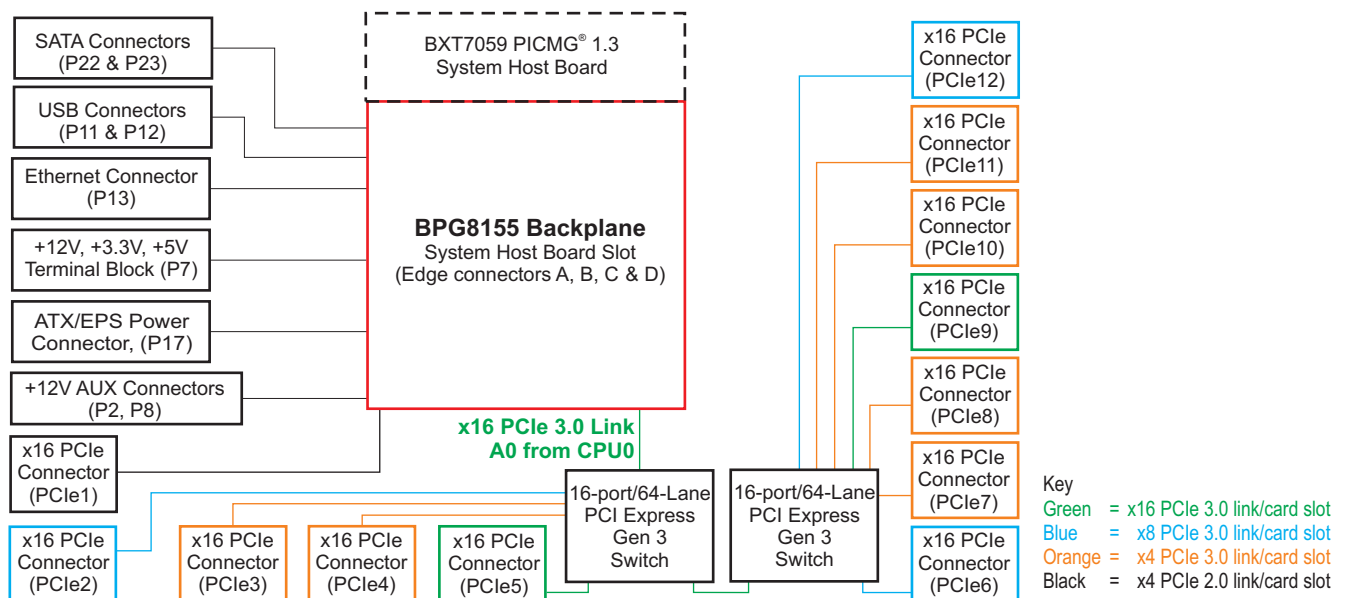# BPG8155

PCI EXPRESS GEN3 BACKPLANE

FEATURES

- **14-slot form factor supports one PICMG® 1.3 system host board**
- **Ideal for dual-processor Trenton BXT7059 and other PCIe Gen3 system host boards**
- **Supports industry standard PCI Express® 3.0, 2.0 and 1.1 option cards**
- **Twelve x16 PCI Express mechanical card slots**
- **PCIe card slot electrical configuration: two x16, three PCIe x8 and seven PCIe x4**
- **Offers seamless PCI Express 3.0 operations when using a BXT7059 SHB****
- **One 10/100/1000Base-T backplane Ethernet port****
- **Four USB 2.0 and two SATA/300 backplane I/O connections****
- **ATX/EPS, +12V AUX and terminal block input power connectors**
- **Five-year factory warranty**
- **Made in U. S. A.**

TRENTON SYSTEMS®
Engineered For Reliability

BLOCK DIAGRAM:

Key
Green = x16 PCIe 3.0 link/card slot
Blue = x8 PCIe 3.0 link/card slot
Orange = x4 PCIe 3.0 link/card slot
Black = x4 PCIe 2.0 link/card slot

PCI EXPRESS Gen3 BACKPLANE:

The PCIe 3.0 link design of the BPG8155 backplane supports a x16 PCIe Gen3 link from Trenton's current BXT7059 system host board as well as future PCIe Gen3 SHBs. The backplane's two, 16-port/64-Lane Gen3 switches deliver PCIe 3.0 links to option card slots PCIe2 through PCIe12 while PCIe1 is driven with a PCIe 2.0 link from the SHB. Both the switches and the BXT7059 automatically establish communications with either PCI Express 3.0, 2.0 or 1.1 option cards. All option card slots utilize x16 mechanical connectors. Card slots PCIe5 and PCIe9 are driven with x16 electrical links while card slots PCIe2, 6 and PCIe12 are driven with x8 electrical links. Card slots PCIe3, 4, 7, 8, 10 and 11 are driven with x4 PCIe 3.0 links. PCIe1 is a slot driven with a x4 interface from the SHB's B0 link. The BPG8155 backplane has a right angle ATX/EPS and two 12V AUX power connectors plus a terminal block to meet expanded system power demands.

APPLICATION EXAMPLES:

Any 4U rackmount computer design deploying the latest PCIe option cards is a good candidate for the BPG8155 backplane. The ability of the backplane to automatically support either PCI Express 3.0, 2.0 or 1.1 cards builds an element of scalability into any COTS system design. The backplane brings the added value of flexibility to the system by supporting many different types of PCI Express option cards including high-end, x16 PCIe Gen3 video, graphics and GPU cards. The backplane's smaller 14-slot form factor lends itself well to medical diagnostics, military/aerospace, video display wall controllers and communication system designs. The slot support of the backplane enables system designs that can grow and adapt to changing requirements without incurring significant system upgrade expense. The BPG8155's ability to support up to twelve PCIe Gen3 COTS cards maximizes system design flexibility, scalability while enabling robust data communications.

BACKPLANE MODEL: BPG8155

MODEL#	MODEL NAME	DESCRIPTION
8155-007	BPG8155-CRA	One ATX/EPS and two 12V AUX right-angle power connectors, one terminal block

BPG81553 LAYOUT & MOUNTING HOLE PATTERN DIMENSIONS:
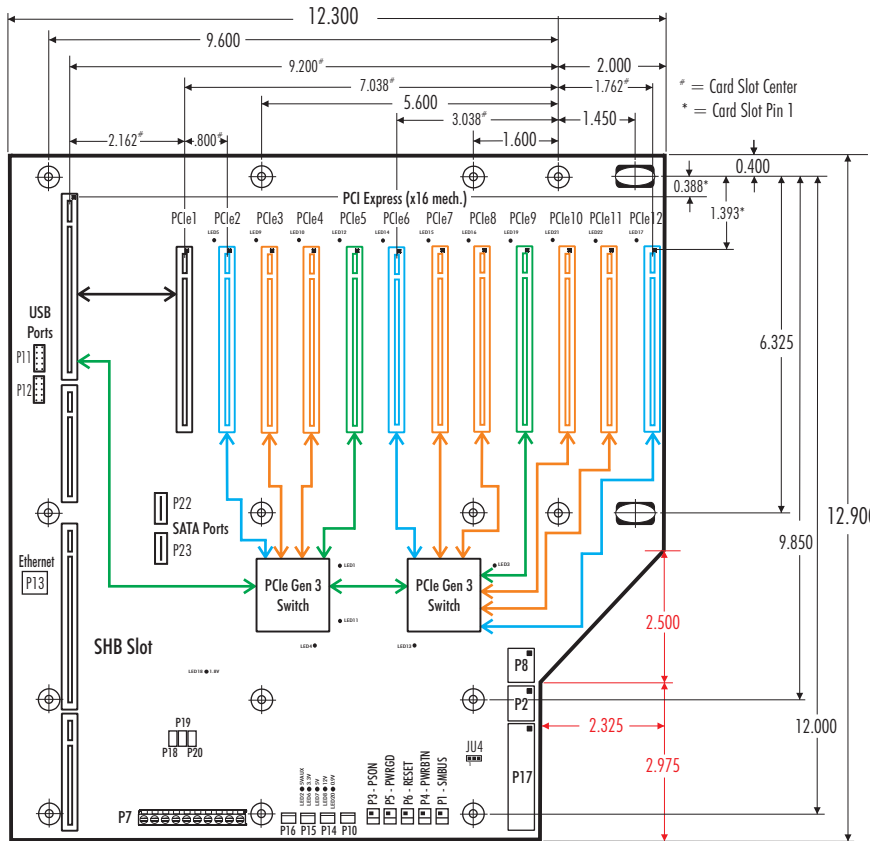
ENVIRONMENTAL SPECS.:#

Operating Temp.: 0° C to 60° C
Storage Temp.: -40° C to 70° C
Humidity: 5% to 90%, non-condensing
#Environmental specifications for system host boards / single board computers are usually lower than those of the backplane. Check with your SHB/SBC vendor.

The Trenton BPG8155 is a lead-free, RoHS compliant backplane.

This backplane is designed to meet worldwide EMI emissions requirements, CE conformity and immunity standards. Contact Trenton for the specific standard numbers this product.

The Trenton BPG8155 backplane is designed for UL60950 and CAN/CSA C22.2 No. 60950-00.

ENGINEERING NOTES:

1. The power connectors are shown in the layout drawing represents backplane model number 8155-007.
2. Mounting holes: 0.156" diameter
3. Nominal PCB thickness: 0.080"
4. All dimensions are inches.
5. ** (from page one) The PCI Express 3.0 links and the optional USB, SATA and Ethernet connectivity is provided by the BXT7059 PICMG 1.3 System Host Board. Not all SHBs support these capabilities.
6. PCIe electrical interface key for the option card slots:
   - Green = Slot driven with a x16 PCIe 3.0 link
   - Blue = Slot driven with a x8 PCIe 3.0 link/card slot
   - Orange = Slot driven with a x4 PCIe 3.0 link/card slot
   - Black = Slot driven with a x4 PCIe 2.0 link/card slot

PCI EXPRESS 3.0 LINK STATUS LEDs:

The BPG8155 provides multiple PCI Express link status LEDs to provide a visual check on the operational speed of the backplane's critical PCI Express links. The links monitored by the LEDs include A0 from the SHB to the first 16-port/64-lane PCI Express Gen3 and the links routed to second switch and card slots PCIe2 through PCIe12. The possible status states of the multi-purpose LEDs are illustrated in the table below.

- PCI Express Link Status LEDs - LED1, LED4, LED5, LED9 through LED17, LED19, LED21, and LED22 -

State	LED Pattern
Link is down	Off
Link is up at 8.0 GT/s (PCIe 3.0)	On
Link is up at 5.0 GT/s (PCIe 2.0)	0.25s On / 0.25s Off
Link is up at 2.5 GT/s (PCIe 1.1)	0.5s On / 0.5s Off

Product Photo Note: The photo of the BPG8155 backplane shown on page one is a provided for illustrative purposes only. Actual connector and mounting locations are illustrated in the backplane layout drawing.

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BACKPLANE JUMPER SETTINGS:

The BPG8155 jumpers are for the most part used during the manufacturing and test of the backplane and have no operational value in most system applications. However, JU4 is the exception to this general rule. JU4 is a +5VAUX jumper that offers a way around the lack of a of the required+5VAUX voltage needed by the SHB in those system configurations using non-ATX/EPS power supplies. Here are the jumper default settings:

Jumper	Function	Pins To Short
P18	SHB I2C Bus	Leave Open, Do No Populate Jumper
P19	PCIe Switch I2C Bus	Leave Open, Do No Populate Jumper
P21	Slot/Clock I2C Bus	Leave Open, Do No Populate Jumper
JU4	+5VAUX Source	ATX/EPS supply, Jumper Pins 2-3