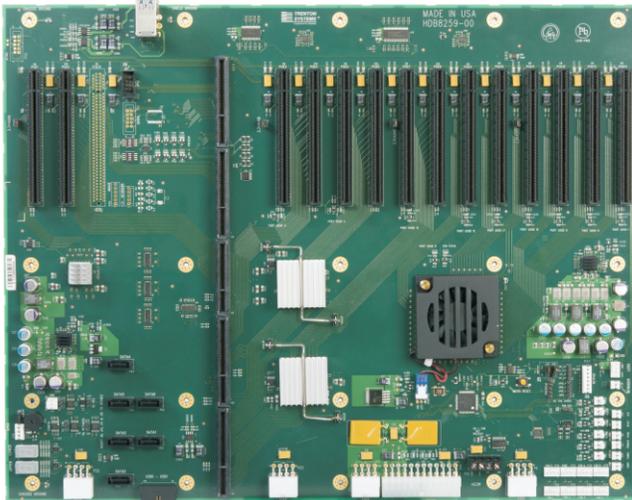# HDB8259

## HDEC® Series LARGE FORMAT BACKPLANE



## FEATURES

- Large form factor backplane supports one HDEC® system host board
- Provides excellent system expansion and configuration options
- Ideal for dual-processor Trenton HEP8225 HDEC Series system host boards
- PCI Express GEN3 links to the SHB's processors maximizes data throughput speeds
- I²C Bus isolation on all PCIe slots for custom applications
- Supports industry standard PCI Express® 3.0, 2.0 and 1.1 option cards
- Fourteen x16 PCI Express mechanical card slots
- PCIe GEN3 card slot electrical configuration: 4 x16, and ten x8
- Six SATA/600 and two USB 3.0, four USB 2.0 system I/O connections
- Built-in system fan control maximizes system longevity
- Five-year factory warranty
- Made in U. S. A.

**TRENTON SYSTEMS®**
*Engineered For Reliability*

## BLOCK DIAGRAM:
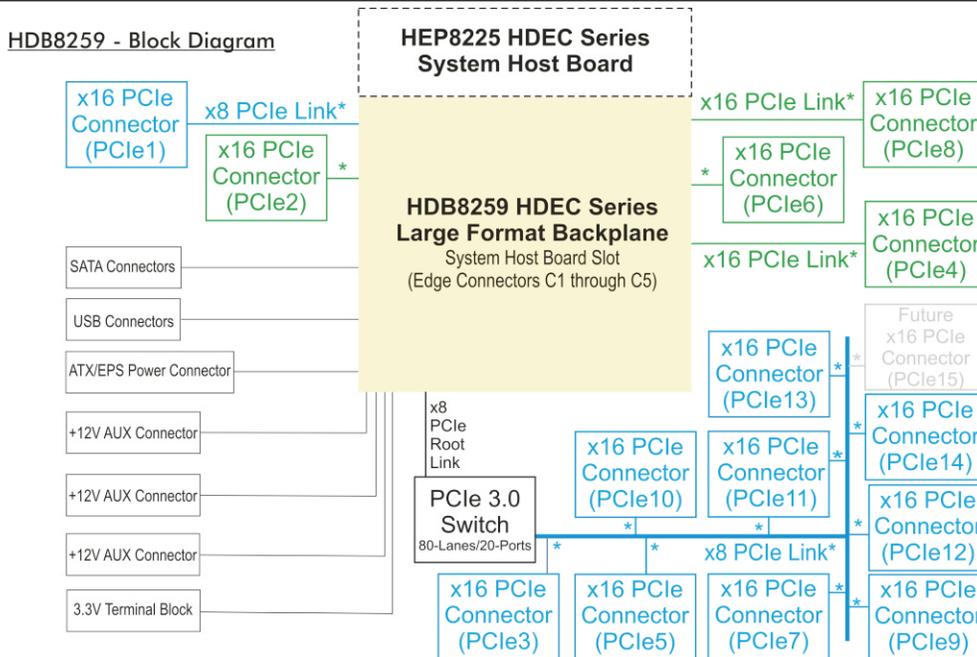


## HDEC SERIES LARGE FORM FACTOR BACKPLANE:

The HDB8259 large form factor backplane is ideal for integrating large numbers of PCI Express option cards into a system powered by a HDEC Series SHB from Trenton, such as the HEP8225.  The HDB8259 takes full advantage of the eighty (80) available PCI Express GEN3 links from the SHB.    All option card slots utilize x16 mechanical connectors with card slots PCIe2, PCIe4, PCIe6 and PCIe8 directly driven at x16 speeds by the SHB's PCIe 3.0 electrical links.  A single slot, PCIe1 is driven by a x8 electrical link from the SHB. The remaining card slots are driven with a x8 PCIe 3.0 electrical link from the SHB which is augmented by a 20 port PCIe 3.0 switch.  Automatic PCIe link negotiation enables support for a wide variety of PCI Express plug-in cards including GPUs.  I²C Bus isolation allows easy deployment of custom code enabling low-level communication with option cards.
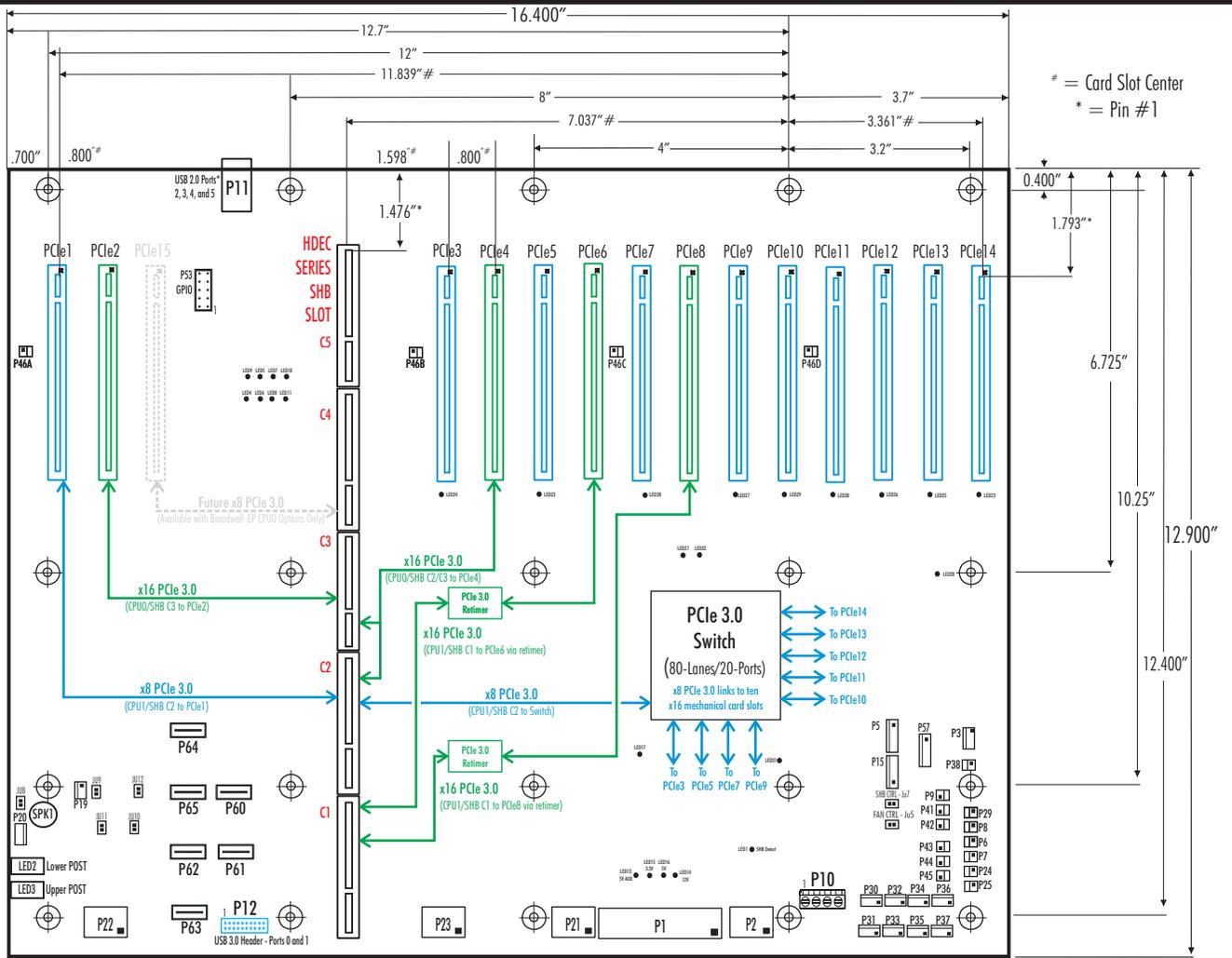
## APPLICATION EXAMPLES:

The  mechanical design of the HDB8259 is targeted toward industry-standard 5U rackmount computer chassis.  Expanded system I/O connections are supported by the backplane in conjunction with a compatible HDEC Series SHB like Trenton's HEP8225.  The placement of the SHB slot on the backplane and the deployment of various system I/O connectors enables simplified system cabling while maximizing system airflow in order to enable long and trouble-free hardware deployments in robust computing applications.  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 system design.  The backplane enhances system design flexibility by supporting the many different types of standard plug-in PCI Express option cards used in medical diagnostics, military/aerospace, video wall controllers and communication systems.

## HDEC SERIES BACKPLANE MODEL:  HDB8259

| MODEL# | MODEL NAME | DESCRIPTION |
|--------|-----------|-------------|
| 8259-037 | HDB8259-CRA | HDEC Series SHB compatible backplane with ATX/EPS and 12V AUX right-angle power connectors, and a 4-position terminal block |

**Backplane layout diagram** — dimensions and component callouts:

Dimensions: 16.400", 12.7", 12", 11.839"#, 8", 7.037"#, 3.7", 3.361"#, 4", 3.2", .700", .800"*#, 1.598"*#, .800"*#, 0.400", 1.793"*, 1.476"*, 6.725", 10.25", 12.900", 12.400"

# = Card Slot Center
* = Pin #1

USB 2.0 Ports* 2, 3, 4, and 5 — P11

PCIe1, PCIe2, PCIe15 (Future x8 PCIe 3.0, Available with Broadwell-EP CPU0 Options Only)

HDEC SERIES SHB SLOT — C5, C4, C3, C2, C1

PCIe3–PCIe14

P53 GPIO, P46A, P46B, P46C, P46D

x16 PCIe 3.0 (CPU0/SHB C3 to PCIe2)
x16 PCIe 3.0 (CPU0/SHB C2/C3 to PCIe4)
x16 PCIe 3.0 (CPU1/SHB C1 to PCIe6 via retimer)
x16 PCIe 3.0 (CPU1/SHB C1 to PCIe8 via retimer)
x8 PCIe 3.0 (CPU1/SHB C2 to PCIe1)
x8 PCIe 3.0 (CPU1/SHB C2 to Switch)
PCIe 3.0 Retimer

PCIe 3.0 Switch (80-Lanes/20-Ports) — x8 PCIe 3.0 links to ten x16 mechanical card slots
To PCIe14, To PCIe13, To PCIe12, To PCIe11, To PCIe10, To PCIe3, To PCIe5, To PCIe7, To PCIe9

Connectors: P64, P65, P60, P62, P61, P63, P22, P23, P21, P1, P2, P10, P12 (USB 3.0 Header - Ports 0 and 1)
P5, P57, P3, P15, P38, SHB CTRL-Ju7, FAN CTRL-Ju5, P9, P41, P42, P43, P44, P45, P29, P8, P6, P7, P24, P25, P30, P31, P32, P33, P34, P35, P36, P37
SPK1, JU8, JU9, JU12, JU11, JU10, P20, P19, LED2 Lower POST, LED3 Upper POST

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## 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 HDB859 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 HDB8259 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 8259-037.
2. Mounting holes: 0.156" diameter
3. Nominal PCB thickness: 0.080"
4. All dimensions are inches.
5. The PCI Express 3.0 links on this HDEC Series backplane are driven directly from the HDEC Series system host board. PCIe 3.0 link re-timers are used to ensure single integrity between the SHB and each plug-in PCIe option card.
6. PCIe electrical interface key for the option card slots:
   Green = Slot driven with a x16 PCIe 3.0 link from the HEP8225 SHB
   Blue = Slot driven with a x8 PCIe 3.0 link from the HEP8225 SHB

*Product Photo Note: The photo of the HDB259 backplane is a provided for illustrative purposes only. Actual connector and mounting locations are illustrated in the backplane layout drawing.*

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## ADDITIONAL SYSTEM INTERFACE CONNECTIONS, JUMPERS and LEDS:
There are a number of additional connectors, jumpers and LEDs available on the HDB8259 that are designed to simplify cable routing in an embedded computer system and aid in system operation.

| Connector | Function | Conn. | Function |
|---|---|---|---|
| P6 | PSON | P45 | HDD LED |
| P7 | PWRBTN | P46 | 3.3V AUX |
| P8 | RESET | | enable (all slots) |
| P9 | PWRGD | | |
| P24, P25 | TEMP0, TEMP1 | | |
| P38 | Intruder | | |
| P41 | FAN Alarm | | |
| P42 | TEMP Alarm | | |
| P43 | VOLT Alarm | | |

| Jumper | Function |
|---|---|
| JU5 | Fan Ctrl Enable |
| JU6 | Four-wire FANs |
| JU7 | SHB Fan Ctrl |
| JU8 | Spk. Enable |

| LEDs | Function |
|---|---|
| 3 | Lower POST Codes |
| 4 - 7 | Sys. Fan Present |
| 10 | 1.0v Pwr. Reg. Gd. |
| 11 | 1.8v Pwr. Reg. Gd. |
| 12 | +3.3V Supply |
| 13 | +5V Supply |
| 14 | +12V Supply |
| 15 | +5V AUX |
| 1 | SHB Present |
| 2 | Upper POST Codes |

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