PCI Express channel switch

For applications that require dynamic allocation of PCI Express lanes, this small channel switch eases PCB layout while introducing very low latency, preserving signal integrity, and providing bandwidth higher than 1 GHz.

Key features
▸ Two-lane PCI Express port multiplexer
▸ Complies with PCI Express signaling environment
▸ Preserves signal integrity and noise margin
▸ Simplifies port switching with very low latency
▸ Maximum utilization of available PCI Express slots
▸ Optimized pinning for easier routing and escape
▸ Lead-free TFBGA-48 package (5 x 5 mm)

The CBTU0808 provides convenient, reliable switching of PCI Express signal paths, so designers can maximize the use of available PCI Express slots.

Dynamic allocation of PCI Express lanes
In motherboard applications, for example, four CBTU0808 devices can be used to reconfigure the x16 PCI Express slot as two x8 slots. In notebook applications, the CBTU0808 can switch between the PCI Express chipsets in the notebook and its docking station.

The device is organized as two PCI Express lanes, each consisting of a transmit and a receive channel. Each channel has four ports — an A and B on the source or host side, and an A and B on the destination or device side. Each port provides a pair of signal lines to support differential PCI Express signaling.

The source and destination ports can be configured to switch from A to A and B to B, from source A to destination B (remaining ports isolated), or to keep all ports isolated. Within a lane, the same switch configuration is supplied to the transmit and receive channels. Two CMOS inputs (CTRL0 and CTRL1) are used to set switch positions.

High-performance operation
The CBTU0808 complies with the PCI Express signaling environment and combines several features to deliver high-performance operation. It has a bandwidth of >1 GHz at -3 dB and preserves the noise margin and integrity of 2.5-Gbps differential PCI Express signals.

The switch on-resistance is only 10 Ω, while the switch on-capacitance is only 3.5 pF. The off-isolation and the channel separation are both -35 dB at 1.25 GHz,


founded by Philips

and the differential skew between the differential pair is only 5 ps. The overall result is simple port switching with very low latency.

Other features include tightly controlled skew, an operating supply voltage of 1.8 V, HBM ESD protection of more than 2 kV, and an operating temperature range in free air of 0 to 85 °C.
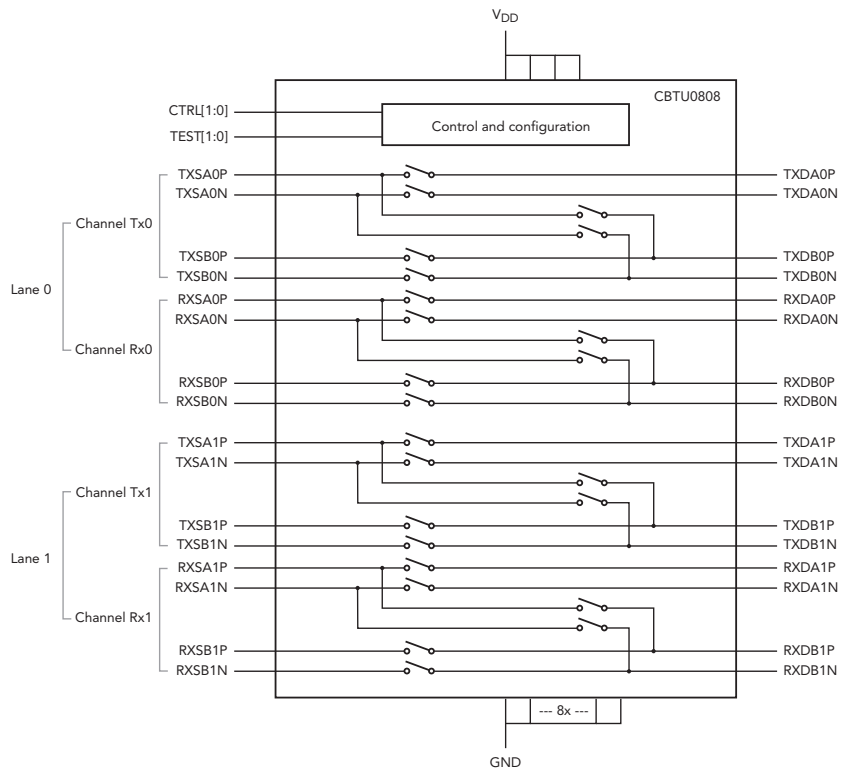
Small package, optimized pinning

The CBTU0808 is housed in a TFBGA package with forty-eight balls and a depopulated grid of 9 x 9, and has a ball pitch of 0.5 mm. It requires only 5 x 5 mm of board space yet allows for adequate signal routing and escape using conventional board technology.

For more information visit:
www.nxp.com/standardics
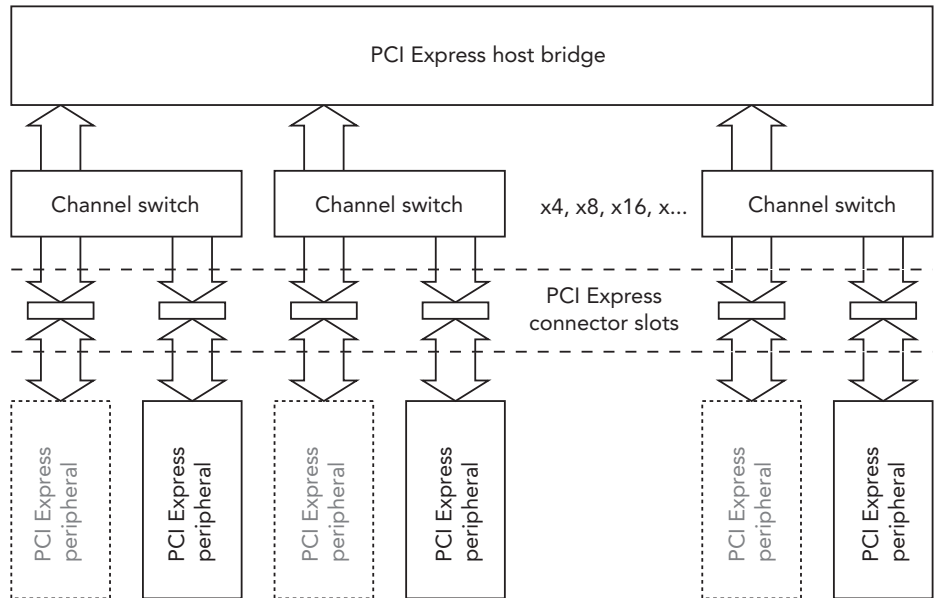
The CBTU0808 uses PCI Express channel switching to support dynamic allocation of the PCI Express lanes

CBTU0808 functional diagram