4 Channel 5Gbps PCIe® Signal Repeater

89HP0504PB
Product Brief

Device Overview

The IDT 89HP0504PB (P0504PB) is a 5Gbps PCIe® Repeater device featuring IDT EyeMax™ technology that compensates for cable and board trace attenuations and ISI jitter, thereby extending connection reach. The device is optimized for PCIe Gen1 and Gen2 high speed serial data streams and contains four data channels, each able to process 5Gbps transmission rates. Each channel consists of an input equalizer and amplifier, signal detection with glitch filter, as well as programmable output swing and de-emphasis. Allowing for application specific optimization, the P0504PB, with its configurable receiver and transmitter features, is ideal for PCIe applications using a wide combination of cables and board trace materials.

All modes of active data transfer are designed with minimized power consumption. In full shutdown mode, the part consumes less than 40mW in worst case environmental conditions.

Applications

- Blade servers, rack servers
- PCIe instrumentation
- Storage systems
- Cabled PCIe devices

Features

- Compensates for cable and PCB trace attenuation and ISI jitter
- Programmable receiver equalization up to 24db
- Programmable transmitter swing and de-emphasis
- Recovers data stream even when the differential signal eye is completely closed due to trace attenuation and ISI jitter
- Full PCIe protocol support
- Configurable via external pins
- Leading edge power minimization in active and shutdown modes
- No external bias resistors or reference clocks required
- Channel mux mode, demux mode, 1 to 2 channels multicast, and Z-switch function mode
- Available in a 36-pin QFN package (4.0 x 7.5mm with 0.5mm pitch)

Benefits

- Extends maximum cable length to over 8 meters and trace length over 48 inches in PCIe applications
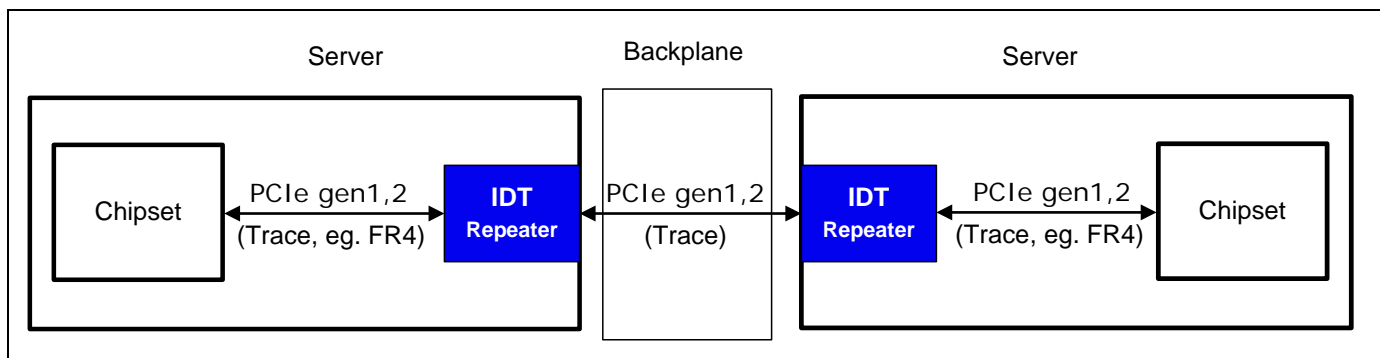- Minimizes BER

Typical Application

Figure 1 IDT Repeaters in Blade Servers

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PCIe Compliance

The device was designed to provide end users with features needed to comply with PCIe system application requirements:

– Receiver Detection Support, PCIe Beacon Support
– Receiver supports high impedance mode for PCIe
– Jitter, eye opening, and all other key AC and DC specifications.

Block Diagram

The P0504PB contains four high speed channels as shown in Figure 2. Each channel can be routed to different outputs. Depending on user configuration via mode selections, input traffic can be muxed, demuxed, or looped back. Powerdown (PDB) and Receiver Detection Reset (RSTB) are provided for state and channel control.
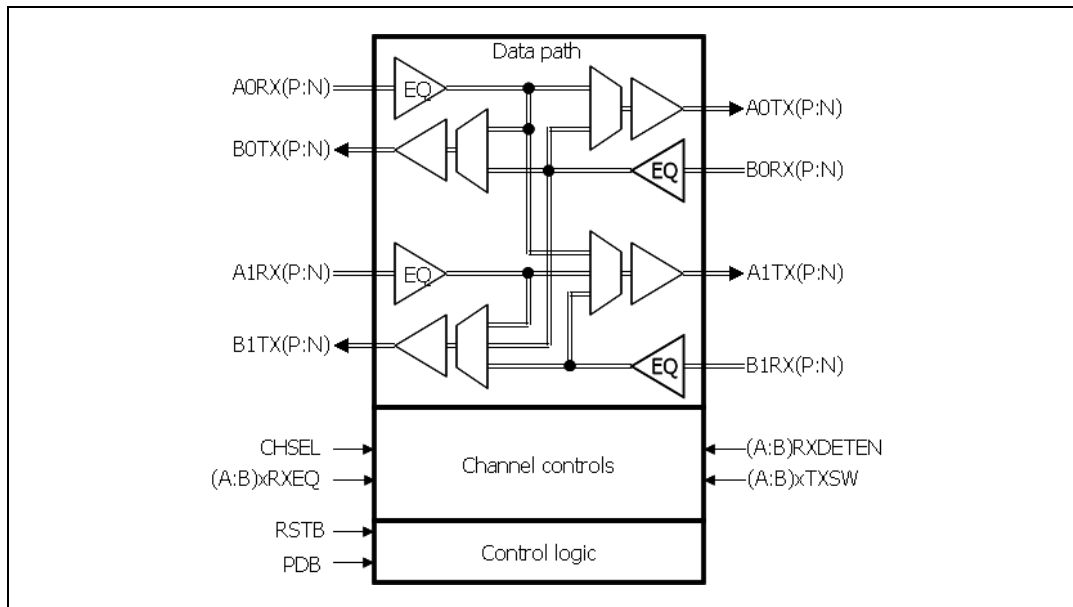

Figure 2 Block Diagram

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