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4x4 Crosspoint Switch with Integrated Multi-Rate CDR and Amplif-Eye™ (42 Mbps to 3.2 Gbps)

M21105/6/7

The M21105/6/7 are high-performance 4x4 crosspoint switches with integrated multi-rate clock and data recovery (CDR) circuits, optimized for multi-lane telecom, and datacom applications. Each channel has an independent multi-rate CDR capable of operating at bit rates between 42 Mbps and 3.2 Gbps, allowing maximum flexibility in system design.

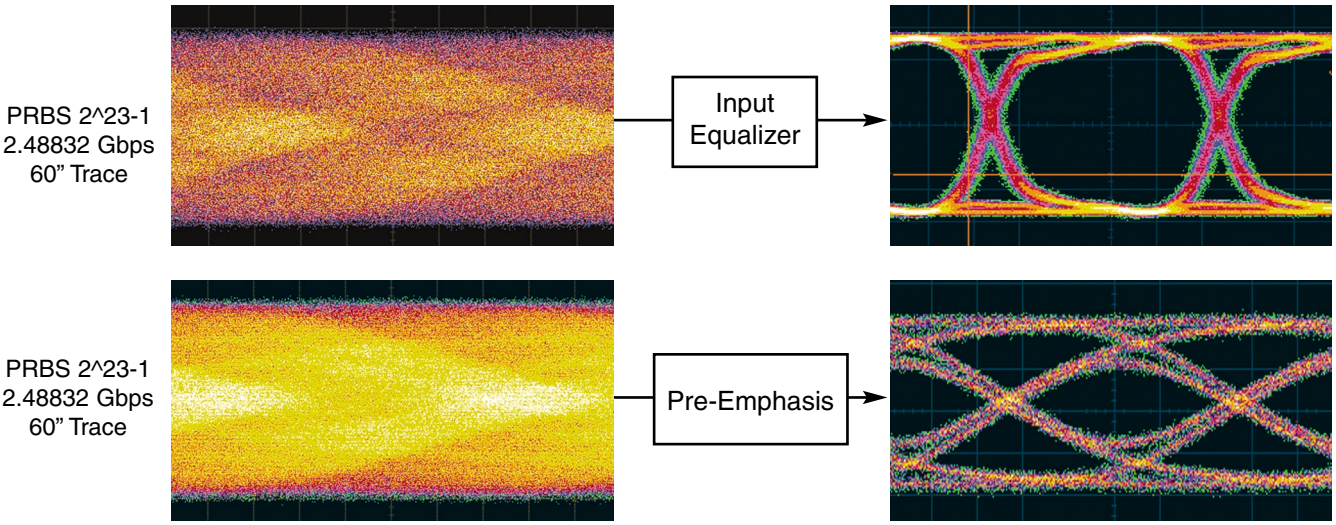
Signal conditioning features include adaptive input equalization and output pre-emphasis, allowing robust reception and transmission of signals to other devices up to 60" away.

User-selectable input interface types allow DC-coupled input to CML, LVDS, and LVPECL. The outputs can also be DC-coupled to CML, LVDS, and LVPECL.

Frequency acquisition is accomplished with an external reference clock. The built-in frequency synthesizer allows multi-rate operation, while operating with a single reference clock. The device can be controlled either through hardwired pins or an I²C-compatible interface. The hardwired mode eliminates the need for an external microcontroller, while allowing control of the key features of the device. The I²C-compatible interface allows complete control of the device features.

KEY FEATURES

- Independent per-channel bit rates of up to 3.2 Gbps
- Four independent multi-rate CDRs capable of running between 42 Mbps and 3.2 Gbps
- Integrated **adaptive equalization** allows use of lower cost board materials with increased link performance
- Available in 3 speed-grade options for cost optimization
- Flexible DC-coupled input/output interface to CML, LVDS, and LVPECL
- Integrated **pre-emphasis** for driving trace lengths up to 60"
- Jitter generation 4.5 mUI, jitter tolerance 0.625 UI typical
- Typical total power consumption as low as 430 mW with all channels running
- Protocol agnostic analog monitoring for system diagnostics
  - Loss of lock
  - Loss of activity



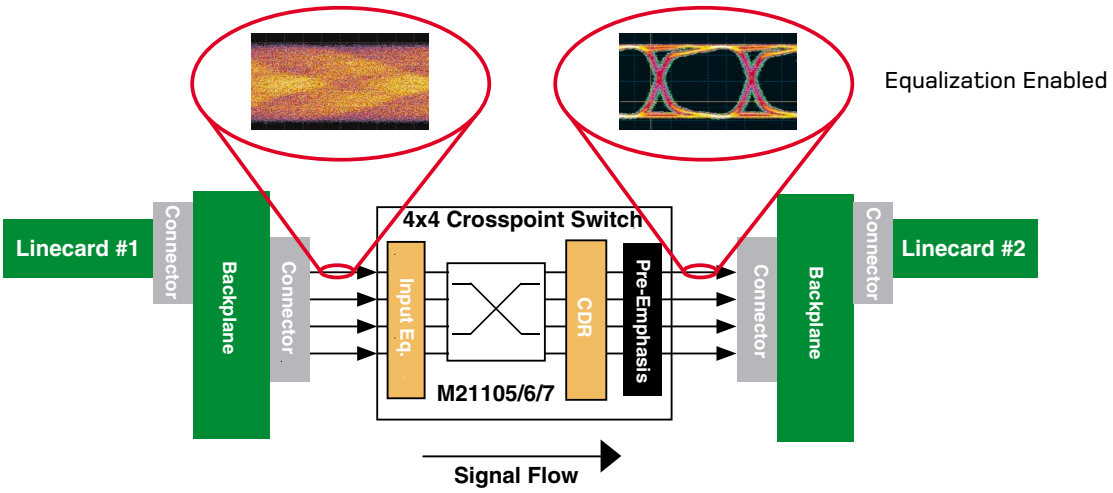


Figure 1: The M21105/6/7 System Diagram – Equalization

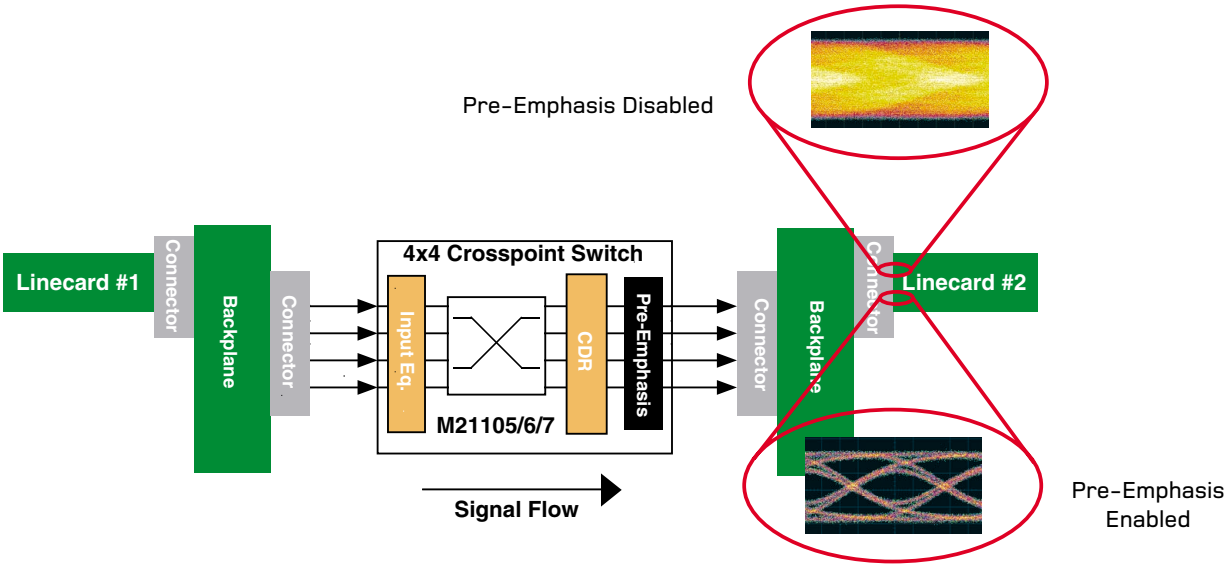


Figure 2: The M21105/6/7 System Diagram – Pre-Emphasis

Product Features

- Flexible control through I²C-compatible interface or hardwired pins
- Simple protection switching configuration through hardwired pins
- Fully non-blocking architecture (any Input to any Output)
- Broadcast and multicast feature
- Built-in pattern generator and receiver for module and system testing
- Optimized for PRBS- or 8b/10b-like data patterns

Applications

- Protection switching and redundancy
- Backplane reach extension
- SONET OC-48, OC-48 with FEC systems and modules
- Fibre Channel (1x, 2x, 10x) systems
- Gigabit Ethernet systems
- 10GBASE-CX4/LX4 XAUI systems & modules
- Serial transceiver functions
- Serial-ATA redundancy
- Port bypass

Ordering Information

Number: M21105 (42 Mbps – 3.2 Gpbs)
M21106 (1 Gbps – 3.2 Gpbs)
M21107 (42 Mbps – 800 Mpbs)

Package data: 72-terminal, 10mm, MLF

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