## Quad Multi-Rate CDR with Amplif-Eye<sup>™</sup> (42 Mbps-3.2 Gbps)

# M21012/11/01

MNDSPEED

The M21012/11/01 are high-performance quad multirate clock and data recovery (CDR) arrays, optimized for multi-lane telecom and datacom applications. Each CDR operates independently at bit rates between 42 Mbps and 3.2 Gbps, allowing maximum flexibility in system design.

BUILD IT FIRST

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.

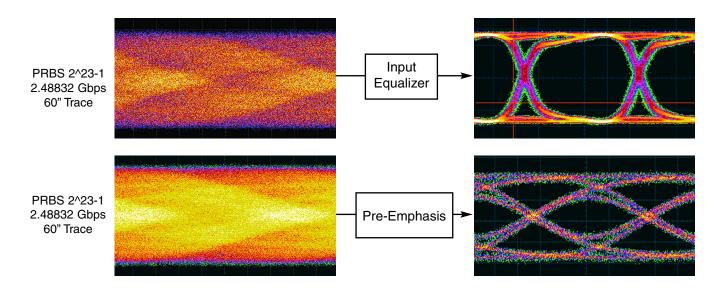
Frequency acquisition is accomplished with an external reference clock. The built-in frequency synthesizer allows multi-rate operation, while operating with a single reference clock.

### KEY FEATURES

- Four independent multi-rate CDRs running between 42 Mbps-3.2 Gbps
- Integrated **adaptive equalization** allows use of lower cost board materials with increased link performance
- Integrated **pre-emphasis** for driving trace lengths up to 60"
- Jitter generation 4.5 mUl, jitter tolerance 0.625 UI typical
- DC-coupled input/output interface to CML, LVDS, and LVPECL

- Flexible control through I<sup>2</sup>Ccompatible interface or hardwired pins
- Typical total power consumption as low as 400 mW with all channels running
- Built-in pattern generator and receiver for module and system testing
- Optimized for PRBS- or 8b/10b-like data patterns

pins or an I<sup>2</sup>C-compatible interface. The hardwired mode eliminates the need for an external micro-controller, while allowing control of the key features of the device. The I<sup>2</sup>C-compatible interface allows complete control of the device features.



The device can be controlled either through hardwired

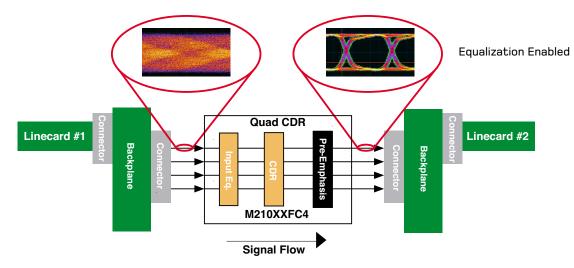
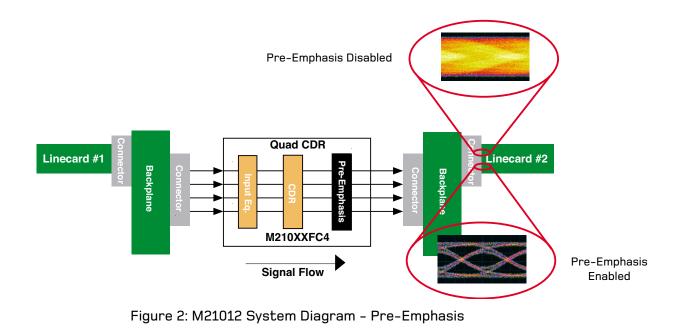


Figure 1: M21012 System Diagram - Equalization



#### **Product Applications**

- SONET OC-1, OC-3, OC-12, OC-48 systems and modules
- Fibre Channel (1x, 2x, 10x) systems
- Gigabit Ethernet systems
- 10GBASE-CX4/LX4 XAUI systems & modules
- ESCON, FDDI, systems and modules
- Backplane reach extension
- Add drop multiplexers (ADM)

Ordering information Number: M21012 (42 Mbps - 3.2 Gbps) M21011 (1 Gbps - 3.2 Gbps) M21001 (42 Mbps - 800 Mbps)

Package data: 72-terminal, 10 mm, MLF

#### www.mindspeed.com/salesoffices

General Information: (949) 579-3000 Headquarters – Newport Beach 4000 MacArthur Blvd., East Tower Newport Beach, CA 92660-3007 21012-BRF-001-B M03-0803 © 2004 Mindspeed Technologies, Inc. All rights reserved. Mindspeed and the Mindspeed logo are trademarks of Mindspeed Technologies. All other trademarks are the property of their respective owners. Although Mindspeed Technologies strives for accuracy in all its publications, this material may contain errors or omissions and is subject to change without notice. This material is provided as is and without any express or implied warranties, including merchantability, fitness for a particular purpose and non-infringement. Mindspeed Technologies shall not be liable for any special, indirect, incidental or consequential damages as a result of its use.

