

## M21351/2/3 4.25 Gbps Backplane Signal Conditioners

### Product Overview

Mindspeed's family of 4.25 Gbps backplane signal conditioners feature small form factor, low power devices that enable data transmission over long backplanes at speeds up to 4.25 Gbps. Mindspeed's Amplif-Eye™ signal conditioning technology enables transmission of 4.25 Gbps data over significant distances while traversing two backplane connectors. These products are specifically designed to operate in environments that suffer from both loss and reflection. Each device channel features an independent equalizer and driver with programmable output swing and de-emphasis to maximize power efficiency. Virtually any digital protocol can be transmitted through the devices at speeds from 50 Mbps to 4.25 Gbps. The list of supported protocols includes: PCI Express, SATA, SAS, Infiniband, 2 x XAUI and Fibre Channel. Mindspeed's backplane signal conditioners are designed to recognize and transparently relay out-of-band (OOB) signals for SATA/SAS and PCI Express. All devices include fully non-blocking switch matrices that allow for simple switching as well as multi-cast functionality. Matrices can also be configured as failover switches. All devices operate from -20° to +85°C. Devices can either be configured via a 2 wire interface or EPROM.

Features	Benefits
➤ Fully non-blocking switch matrices	Ultimate flexibility for switching and copying signals
➤ SMPTE 424M, 344M, 292M, 259M, and DVB-ASI compatible	Robust video compatibility
➤ Input equalization and output de-emphasis available	Maximizes transmission length
➤ Low power usage per channel	Minimizes cost to operate and cool
➤ Small QFN packages	Provides space efficiency and reliability
➤ Out of band signaling support	Allows for seamless integration into PCIe, SATA and SAS
➤ Protocol agnostic	One device supports multiple applications
➤ 1.2 Volt core / optional 1.2 or 1.8 Volt IO	Flexibility to use right power performance
➤ Extended temperature range (-20° to 85° C)	Provides additional margin for most applications
➤ Data rate independent	Operates to 4.25 Gbps, no reference clock required

	M21351	M21352	M21353
<b>Switch Matrix</b>	4x4	8x8	12x12
<b>Power (mW) at 1.2V</b>	580	920	1300
<b>Package (mm)</b>	6x6 40 pin QFN	10x10 72 pin QFN	12x12 88 pin QFN
<b>EQ Control Type</b>	Adaptive	Program	Program

Fig. 1 - Product Selector Table

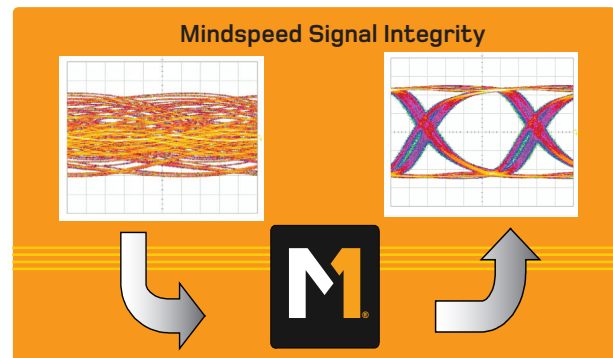


Fig. 2 - Mindspeed Signal Integrity



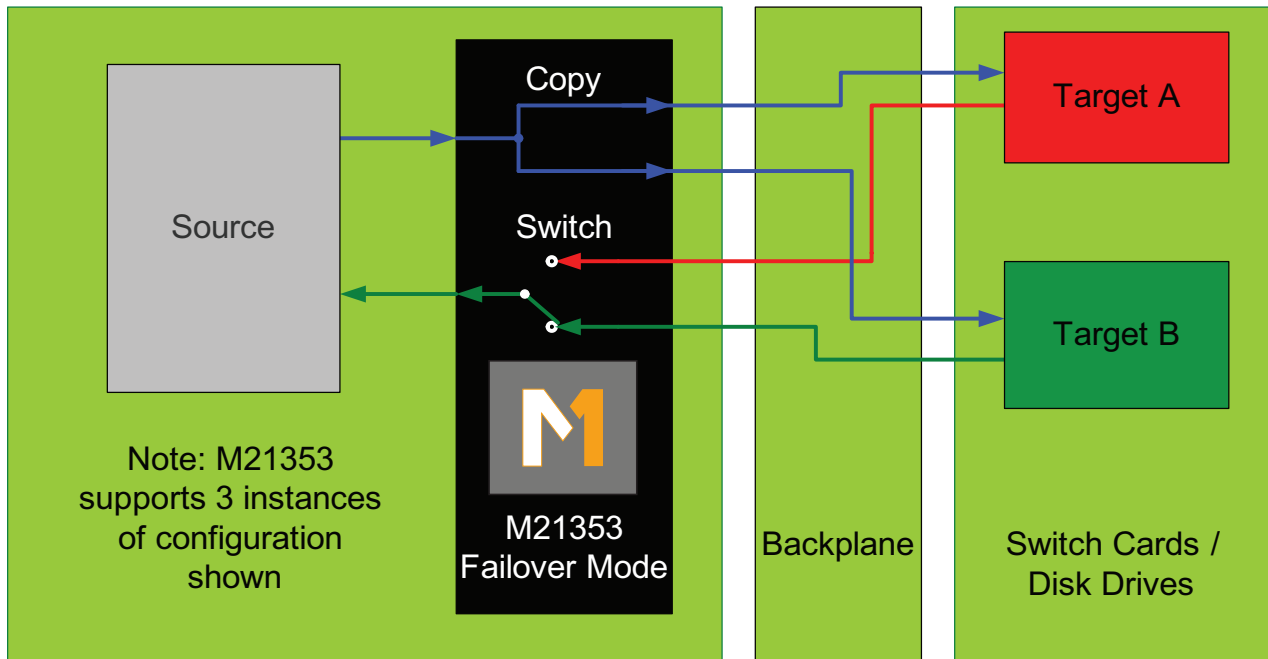


Fig. 3 - M21353 Application Diagram: Failover / Redundancy Switch

### Product Features

- Protocol agnostic
- Supports SMPTE 424M, 344M, 292M, and 259M, DVB-ASI
- Supports rates from 50 Mbps to 4.25 Gbps
- Transparently relays OOB/EBI
- Extended temperature range -20° to +85°C
- Boundary scan
- 1.2V core
- 1.2V or 1.8V IO option

### Applications

- Backplane equalizer / driver
- SDI video and DVB-ASI equipment
- SATA / SAS redundancy switch
- Blade server board to board interconnect
- Infiniband reach extension
- PCI Express failover switch

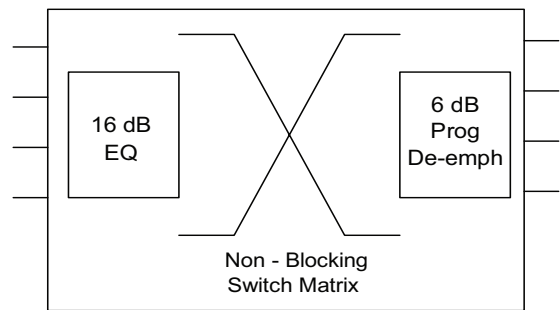


Fig. 4 - M21451/2/3 Device Architecture

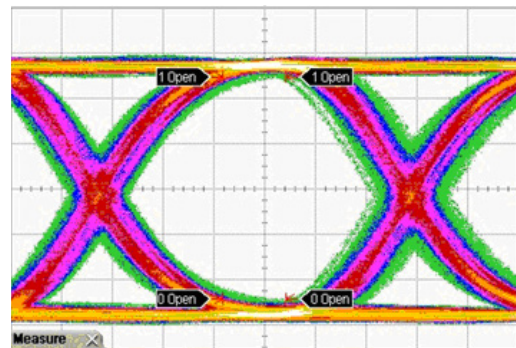


Fig. 5 - 4.25 Gbps Equalized After 40" Trace

For more product information, please visit [www.mindspeed.com](http://www.mindspeed.com).

[www.mindspeed.com/salesoffices](http://www.mindspeed.com/salesoffices)  
 General Information: (949) 579-3000  
 Headquarters – Newport Beach  
 4000 MacArthur Blvd., East Tower  
 Newport Beach, CA 92660-3007  
 M21351-2-3-BRF-001-D.pdf

© 2010 Mindspeed Technologies, Inc. All rights reserved. Mindspeed and the Mindspeed logo are trademarks of Mindspeed Technologies, Inc. All other trademarks are the property of their respective owners. Although Mindspeed Technologies, Inc. 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, Inc. shall not be liable for any special, indirect, incidental or consequential damages as a result of its use.

**MINDSPEED**  
 BUILD IT FIRST®