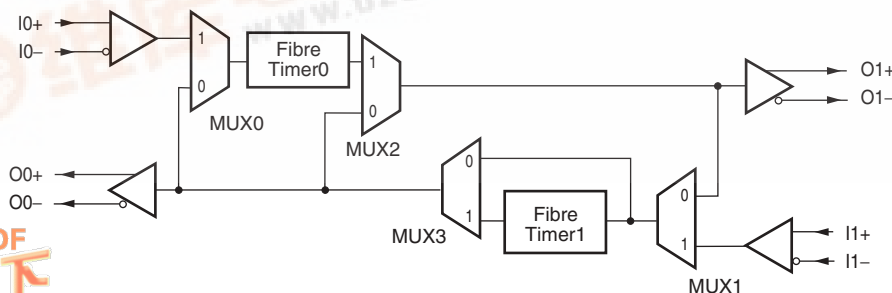# VSC7142

**VITESSE**

## VSC7142 Dual Repeater/Retimer for Fibre Channel and Gigabit Ethernet

### FEATURES:

( Two FibreTimer™ Cells Configurable as:
- Repeaters for Low Latency
- Retimers for True Fibre Channel Compliance
- Provides Design Flexibility by Allowing Mixing and Matching of the Functions for Design Optimization

( Digital Design of the FibreTimers Produce a Device that is Well Controlled Over Voltage, Process and Temperature Variations – Provides a More Robust and Reliable Design

( Supports Both 1.0625 Gb/s and 2.125 Gb/s Fibre Channel Data Rates – Dual Mode Provides Flexibility by Having One Device for New and Legacy Designs

( Supports 1.25 Gb/s Data Rates for Gigabit Ethernet Applications

( User-Selectable, On-chip Receive Termination at Either 100δ or 150δ

( Speed Independent Tx and Rx Paths Aid in Fibre Channel Auto-Speed Negotiation

( World-class Signal Integrity for Jitter Compliance – Reduces Debug and Redesign Efforts

( Two Digital/Analog Signal Detect Units to Detect the Presence of Valid Fibre Channel Encoded Serial Data – Improves Signal Detect Reliability

( User Selectable Pre-emphasis on all High-speed Outputs – Compensates for Deterministic Jitter Due to Long Traces and Cables

( 106.25MHz or 125MHz Reference Clock

( 5V-tolerant LVTTL Inputs – Provides Design Flexibility and Backward Compatibility

( Cable Equalization on all High-speed Inputs – Reliably Recovers Jittery Signals

( Single 2.5V Supply – Reduces Wiring Complexity

( 64-pin, 10x10mm TQFP Package – Ideal for High Density Designs

### BLOCK DIAGRAM:

# VSC7142

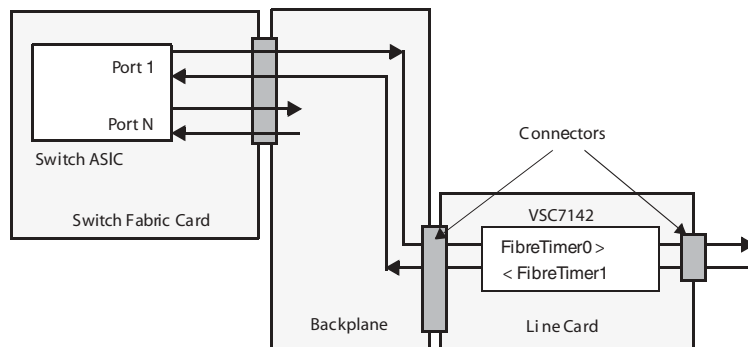**VSC7142 Dual Repeater/Retimer for Fibre Channel and Gigabit Ethernet**

## GENERAL DESCRIPTION:

The VSC7142 contains two FibreTimer Repeater /Retimer cells and Signal Detect Units (SDUs) primarily used for bidirectional signal clean up applications. Each FibreTimer cell contains an all-digital clock recovery unit which can be configured as either a Repeater or a Retimer. Repeaters recover the incoming signal and retransmit the data synchronously to the recovered clock in order to attenuate jitter so that downstream devices see high amplitude, low jitter signals. Retimers eliminate jitter transfer by retiming the recovered data to the local reference clock. An add/ drop FIFO inserts or deletes 40-bit Fibre Channel Fill Words to match the incoming data rate to the local reference clock, thereby ensuring Fibre Channel compliance at the output of the Retimer. The VSC7142 also operates as a Repeater for Gigabit Ethernet applications at 1.25 Gb/s. Retimer mode is not available for Gigabit Ethernet applications.

## MULTI-NODE SWITCH APPLICATION:

One application for the VSC7142 is in high port-count Fibre Channel and Ethernet systems, such as switches. The following diagram shows a switch with a CMOS protocol ASIC with integrated Serializer/Deserializers (SerDes) located on the Switch Fabric card. Serial data from the protocol ASIC passes through multiple connectors and long traces on the PCB before reaching the connector. Without the VSC7142, the signal quality at the connectors would result in poor system performance. However, by using the VSC7142, signal quality is ensured to meet the specifications of Fibre Channel standards at the system interface connectors.



Fibre Channel Switch