1.5Gbps to 6Gbps SAS/SATA Signal Repeater

89HP0602S
Product Brief

Device Overview

The IDT 89HP0602S is a 1.5Gbps to 6Gbps Repeater IC that reconditions high-speed serial data streams. The 89HP0602S contains two half-duplex data lanes, where each half-duplex lane consists of a differential equalizer, as well as a transmit driver that includes de-emphasis.

High speed serial interconnects are being used as the interconnect medium between various platforms and ICs in all types of computing environments: computing, storage, consumer electronics, and communication applications. The 89HP0602S is targeted to meet the high-performance needs of SAS/SATA applications.

Features

- **2 Channel Signal Repeater**
- **Advanced Signal Conditioning Features**
  - Programmable input equalization
  - Programmable output de-emphasis
- **Advanced Diagnostic Features**
  - LOS detection
  - Individual channel loopback
- **Advanced Power Saving Features**
  - Adjustable output voltage swing
  - Individual channel power down mode support
  - Low power consumption (~110mW/channel)
- **Built-in Mux/Demux for Fail-Over Support**
- **I^2C Programming Interface**
- **Commercial and Industrial Temperature**

Benefits

- **Most cost effective way to boost signal integrity**
- **Adds margin to your board design**
- **Simplifies and adds flexibility to board design**
- **Most power efficient solution**
- **Extends cable reach**

Device Description

Receiver Variable Termination: Is a ground referenced termination block that supports a 100 ohm termination for normal operation.

Equalizer: Provides up to 30dB equalization capability in the receiver over 50 inches of FR4 @ 6Gbps while the wide-swing transmit drive offers up to 8.5dB of transmit de-emphasis.

Signal Detect: Measures the envelope of the incoming signal and indicates when the envelope has fallen below a programmable threshold. When electrical idle is detected on the receiver, the signal detect output is used to place the transmitter into electrical idle. For SATA Out-Of-Band (OOB) signaling, the attack and decay times of the analog signal detector are less than 15ns.

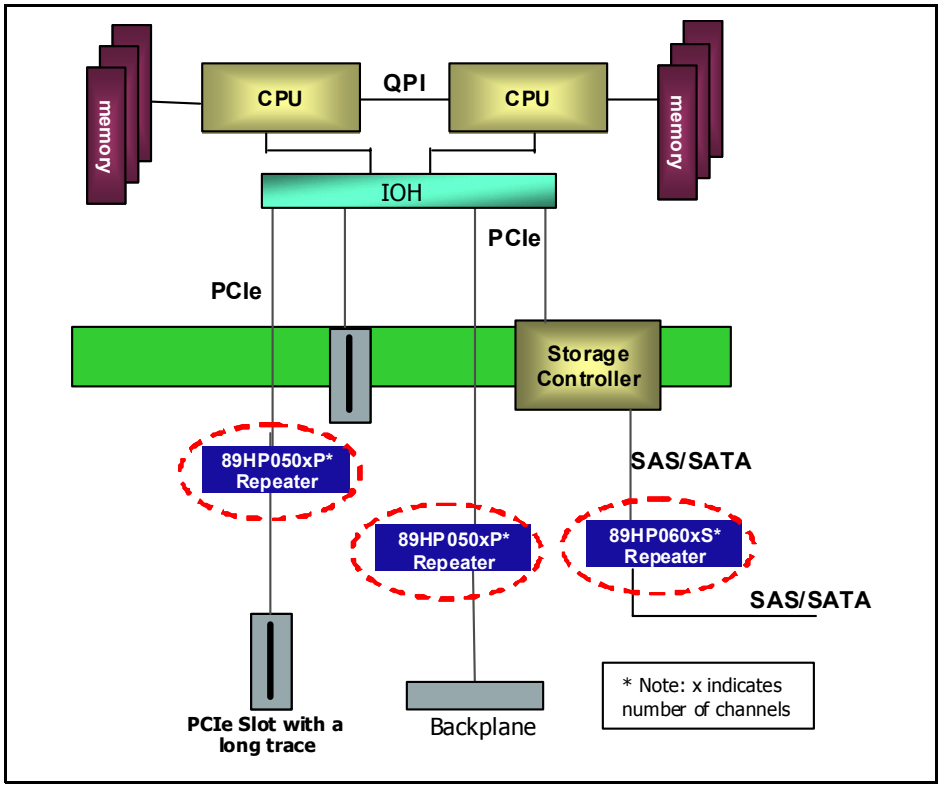
Transmitter Variable Termination: Is a supply referenced termination block that supports a 100 ohm termination for normal operation. It will also support the following additional terminations:

- Squelch mode: The transmitter supports a Squelch mode, whereby the transmitter stops toggling and maintains the transmit common-mode voltage.
- Standby mode: The transmit terminations are increased to approximately 1K ohm when the channel is powered down. All current consumption of the driver is disabled and the transmitter common-mode transitions to the supply, VDD.

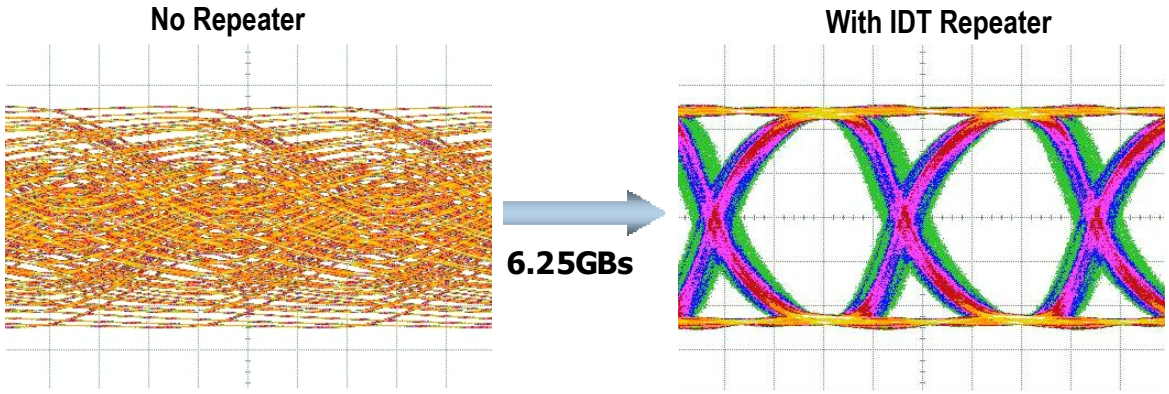
Output Driver: Provides 400 - 800 mVdiff-pkpk output swing. It also provides 0 to 8.5dB of transmit equalization and supports Squelch Mode where the outputs go to common-mode with an exit/entry latency of less than 8ns. Both the amplitude and equalization are programmable.

Applications

IDT's Repeater products fit into server, storage, and blade products.



Improving Signal Integrity with IDT Repeaters



Example Eye diagram measured on actual silicon with FR4 and PRBS patterns

CORPORATE HEADQUARTERS
6024 Silver Creek Valley Road
San Jose, CA 95138

for SALES:
800-345-7015 or 408-284-8200
fax: 408-284-2775
www.idt.com

for Tech Support:
email: siphelp@idt.com
phone: 408-284-8208