DS110RT410, DS110DF410 PRODUCT BRIEF

ADVANCE INFORMATION
January 20, 2012

Low Power Multi-Rate Quad Channel Retimer

General Description

The DS110RT410/DS110DF410 is a four-channel multi-rate retimer with integrated signal conditioning. Both the DS110RT410 and the DS110DF410 include an input Continuous-Time Linear Equalizer (CTLE) on each channel. The DS110DF410 also includes a five-tap Decision Feedback Equalizer (DFE) on each channel.

The DS110DF410 can enhance the reach and robustness of long, lossy, crosstalk-impaired high speed serial links to achieve BER < 1×10^{-15}. For less demanding applications/interconnects, the non-DFE variant DS110RT410 can be used to achieve the same BER performance. The two devices are pin-compatible.

Each channel of the DS110RT410/DS110DF410 independently locks to serial data at data rates from 8.5 to 11.3 Gbps or to any supported submultiple of these data rates. A reference clock is not required, which simplifies system design and lowers overall cost. Both the DS110RT410/DS110DF410 support half-rate, quarter-rate and one-eighth-rate for backward compatibility. A protocol select mode is available to speed up lock time.

Programmable transmit de-emphasis (up to -12 dB), transmit V_{OD} (up to 1300 mVp-p) and adaptive receive equalization (up to 34 dB boost at 5 GHz) enable data transmission over lossy copper cables of typical lengths greater than 10 m or backplanes with multiple connectors and typical trace lengths greater than 40 inches. The CDR function is ideal for use in parallel optical modules to reset the jitter budget and retime high speed serial data.

The programmable settings can be applied easily using the SMBus interface or they can be loaded via an external EEPROM. An on-chip eye monitor and a PRBS generator allow real-time measurement of high speed serial data for system bring-up or field tuning.

The device is offered in a 48-pin LLP, 7 mm x 7 mm flow-through package.

Notice: This document is not a full datasheet. For more information regarding this product or to order samples please contact your local Texas Instruments sales office or visit http://www.ti.com.

Features

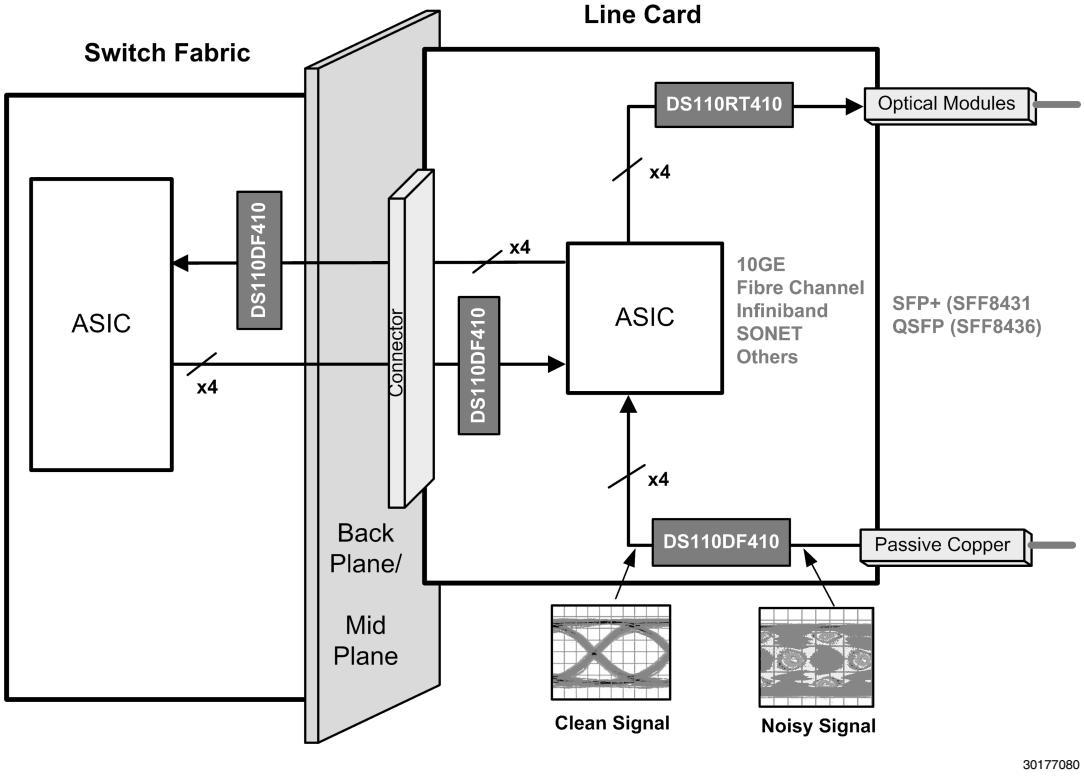
- All devices in the retimer family are pin compatible with each other and with the quad buffer-repeater. The pin-compatible device family includes the following:
  - DS100RT410 (EQ+CDR+DE): 10.3125 Gbps
  - DS100DF410 (EQ+DFE+CDR+DE): 10.3125 Gbps
  - DS110RT410 (EQ+CDR+DE): 8.5 - 11.3 Gbps
  - DS110DF410 (EQ+DFE+CDR+DE): 8.5 - 11.3 Gbps
  - DS125RT410 (EQ+CDR+DE): 9.8 - 12.5 Gbps
  - DS125DF410 (EQ+DFE+CDR+DE): 9.8 - 12.5 Gbps
  - DS100BR410 (EQ+DE): Up to 10.3125 Gbps
- Typical Power Dissipation (EQ+CDR+DE): 150 mW / chn
- Typical Power Dissipation (EQ+DFE+CDR+DE): 180 mW / chn
- Locks to 1/2, 1/4, 1/8 legacy data rates
- Fast lock operation based on protocol select mode
- Adaptive equalization up to 34 dB boost at 5 GHz
- Adjustable transmit V_{OD} : 600 to 1300 mVp-p
- Adjustable transmit de-emphasis to -12 dB
- Programmable output polarity inversion
- Input signal detection, CDR lock detection/indicator
- On-chip Eye Monitor (EOM), PRBS generator
- Single 2.5 V ±5% power supply
- SMBus/EEPROM configuration modes

Applications

- Host-side front-port and backplane interface, SFF-8431, SFF-8436
- Ethernet: 10GbE, 1GbE
- Infiniband: SDR, DDR, QDR
- Fibre-Channel: 2GFC, 4GFC, 8GFC, 10GFC
- SDH/SONET : OC-48 (2.488 Gbps), OC-192 (9.952 Gbps)

© 2012 Texas Instruments Incorporated

Typical Application Diagram



Notes

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

TI products are not authorized for use in safety-critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement specifically governing such use. Buyers represent that they have all necessary expertise in the safety and regulatory ramifications of their applications, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of TI products in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by TI. Further, Buyers must fully indemnify TI and its representatives against any damages arising out of the use of TI products in such safety-critical applications.

TI products are neither designed nor intended for use in military/aerospace applications or environments unless the TI products are specifically designated by TI as military-grade or "enhanced plastic." Only products designated by TI as military-grade meet military specifications. Buyers acknowledge and agree that any such use of TI products which TI has not designated as military-grade is solely at the Buyer's risk, and that they are solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI products are neither designed nor intended for use in automotive applications or environments unless the specific TI products are designated by TI as compliant with ISO/TS 16949 requirements. Buyers acknowledge and agree that, if they use any non-designated products in automotive applications, TI will not be responsible for any failure to meet such requirements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Products		**Applications**	
Audio	www.ti.com/audio	Automotive and Transportation	www.ti.com/automotive
Amplifiers	amplifier.ti.com	Communications and Telecom	www.ti.com/communications
Data Converters	dataconverter.ti.com	Computers and Peripherals	www.ti.com/computers
DLP® Products	www.dlp.com	Consumer Electronics	www.ti.com/consumer-apps
DSP	dsp.ti.com	Energy and Lighting	www.ti.com/energy
Clocks and Timers	www.ti.com/clocks	Industrial	www.ti.com/industrial
Interface	interface.ti.com	Medical	www.ti.com/medical
Logic	logic.ti.com	Security	www.ti.com/security
Power Mgmt	power.ti.com	Space, Avionics and Defense	www.ti.com/space-avionics-defense
Microcontrollers	microcontroller.ti.com	Video and Imaging	www.ti.com/video
RFID	www.ti-rfid.com		
OMAP Mobile Processors	www.ti.com/omap		
Wireless Connectivity	www.ti.com/wirelessconnectivity		
	TI E2E Community Home Page		e2e.ti.com

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2012, Texas Instruments Incorporated