GiGA® LXT19908

10Gbit/s Limiting Amplifier Device

Product Description

GiGA®, an Intel company, has developed the LXT19908 wide bandwidth Limiting Amplifier (LIA) device for use in SDH STM-64, SONET OC-192, G.709, DWDM and 10GE receiver applications in optical communication systems. The LXT19908 has a high dynamic range, providing linear gain higher than 40dB.

The high input sensitivity LIA accepts input signals below 2Vpp differential and tolerates a maximum of 1Vpp for single-ended applications. The output swing is adjusted by the Voltage Output (VSET) control and can be varied between 0 and 1Vpp, which facilitates interoperability between CDR and DEMUX components. The input and output ports are internally terminated at 50Ω, and an external offset control can be implemented to optimize sensitivity of the CDR.

Low power dissipation is approximately 260–800mW, depending on the output swing (no heat sink required). The LXT19908 is assembled in a 16-pin 5.8 x 5.8 mm ceramic QFP package, using small form factor design to reduce the overall size of the PCB.

The LXT19908 is manufactured in a proven GaAs technology, offering the performance, stability, and reliability customers require for optical communication systems.

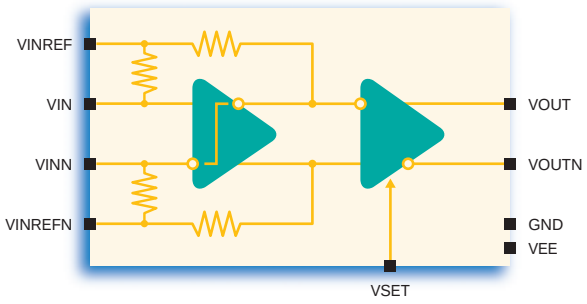

Figure 1. Input/Output Schematic

Flexible Input/Output Design

The GiGA LXT19908 inputs may be either AC- or DC-coupled, with input termination through VINREF/VINREFN pins as shown in Figure 1. If the inputs are AC coupled, the LXT19908 features internal DC offset compensation. The outputs have 50Ω termination internally and can also be AC- or DC-coupled.

When single-ended input is required, the unused input should be terminated with 50Ω to ground. For optimal sensitivity, of the decision circuit following the LXT19908, an external offset control can be applied. This works with both DC- and AC-coupled inputs, as well as single-ended and differential configurations.

Key Applications

- SDH STM-64
- SONET OC-192
- DWDM systems
- 10Gbit/s Ethernet receivers
- OTN, 10Gbit/s FEC with up to 25% overhead

Feature	Benefit
• 40dB single end gain	• High dynamic range
• Input sensitivity: 2x5mVpp differential and 1x10mVpp single-ended input	• Helps increase power budget
• Power supply: -5.2V	• Easy board design and integration
• Adjustable output 0-1Vpp	• Interoperability between CDR and DEMUX components
• 260-800mW power dissipation	• High integration
• Ceramic QFP package	• No heat sink and small form factor (5.8x5.8 mm)

Figure 2. Typical receiver line card

Typical Receiver Line Card Application Overview

An optical reception system receives an optical signal and converts it to an electrical signal. The optical receiver, a PIN diode or an Avalanche Photo Detector (APD) converts the optical input to a small electrical current. The current is converted to an electrical voltage by a Trans-Impedance Amplifier (TIA), often called a post-amplifier. The signal from the TIA varies from a few mV to 50mVpp or more, and can be passed to an AGC amplifier or a LIA to obtain a signal with sufficient power to drive the next building block as shown in Figure 2.

The LIA generates an output signal composed of square pulses due to the large internal gain combined with the cutting of the signal extremes. The CDR device converts the analog input signal to a digital bit stream with an associated clock signal. Finally, the serial high-speed data stream is converted to a parallel signal at lower speed, which interfaces with the digital processing system.

Pre-Amplifier Application

When the GiGA LXT19908 is used as a pre-amplifier with the GD16584 (10Gbit/s) or GD16588 (10.7Gbit/s), optimal sensitivity is obtained when the adjustable output is set to approximately 400mV amplitude (600mVpp). The LXT19908 can be coupled directly to the GD16584 or GD16588, as illustrated in the system diagram, Figure 3.

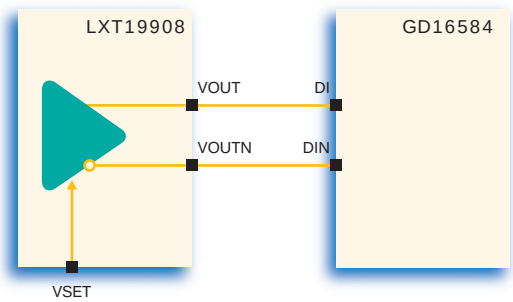

Figure 3. Pre-Amplifier Application

Intel® Internet Exchange Architecture

Intel® Internet Exchange Architecture is an end-to-end family of high-performance, flexible and scalable hardware and software development building blocks designed to meet the growing performance requirements of today's networks. Based on programmable silicon and software building blocks, Intel® IXA solutions enable faster development, more cost-effective deployment and future upgradability of network and communications systems. Additional information can be found at www.intel.com/IXA

Support Collateral

- LXT19908 Data Sheet
- LXT99908 Data Sheet Evaluation Board, Footprint and Gerber files
- LXT19908 Test Report

GiGA Access

Web Site	www.giga.dk
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