Intel® LXT16768/69/59 Multiplexer/DeMultiplexer Chipset

Product Overview

The Intel® LXT16768, LXT16769, and LXT16759 form a high-performance Mutiplexer/DeMultiplexer (MUX/DeMUX) chipset for SONET OC-192 telecommunications systems, Optical Transport Network (OTN) systems with Enhanced Forward Error Correction (EFEC), Dense Wavelength Division Multiplexing (DWDM) for terrestrial and submarine transport systems, and fiber optic test equipment.

Manufactured using the BiCMOS7 process for optimal power and performance ratio, the Intel LXT16768/69 chipset ensures stability and reliability in Telco-class networking equipment. The 12.5Gbps chipset is perfectly aligned with the Intel® IXF30007 (EFEC) to provide 9dB gain in system sensitivity specifically for Ultra Long-Haul applications.

The Intel® LXT16768 DeMUX

This high-performance Serializer/Deserializer (SerDes) chipset features low-power dissipation and automatic operation adjustment in the 11–12Gbps and 12–13Gbps range. The LXT16768 has an integrated Clock and Data Recovery device (CDR) with 1:16 DeMUX and Limiting Amplifier (LIA).

The Intel LXT16768 has a DeMUX merged with a CDR and is fully compliant with the Optical Interface Forum's SFI-4 recommendation on common electrical interface between framers and SerDes for OC-192/STM 64.

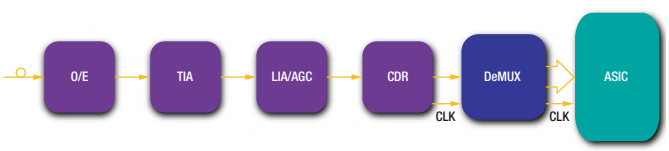
The 12.5Gbps DeMUX transforms the serial data signals into 16-bit parallel data signals at a corresponding lower data rate.

The Intel® LXT16769/59 MUX

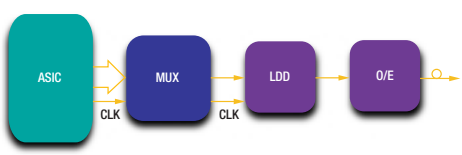
The Intel LXT16769/59 features a 16:1 transmitter with integrated clock generation, Phase Locked Loop (PLL) circuits, and MUX with a 2-bit FIFO and dynamic phase alignment. The integrated functionalities in the devices ensure a simple board design, high input sensitivity, and optimal power consumption.

The Intel LXT16759 features a full or half line rate output clock. The fully integrated on-chip PLLs feature the unique dynamic phase alignment between ASIC and MUX and eliminate critical clock and data timing relations. Continuous handling of round-trip delay variations by the source synchronous clocking ensures easy external optimization of jitter.

(continued)



Typical receiver line card



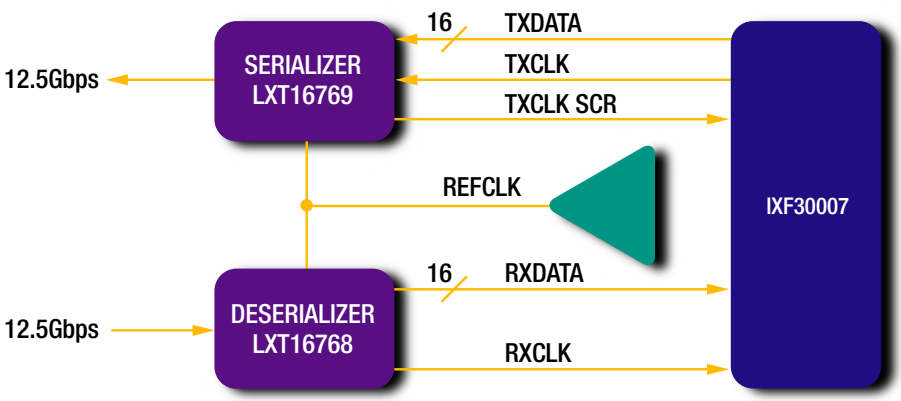
Typical transmitter line card

The Intel® LXT16769/59 MUX *(continued)*

Intel has directed significant effort in the system and component design at maintaining precise, constant duration of the bit periods in the outgoing data stream. The Intel LXT16769/59 MUX converts a 16-bit parallel signal into one serial bit stream at a corresponding higher data rate.

The clock interconnections between the MUX and the data source, such as the framer, can be complex in high-speed applications. In high-speed clock operation for MUX, the input sampling clock must be in the phase to ensure correct loading of the data into the MUX so that input data can be sampled correctly. In addition, the internal high-speed clock used for shifting data to the laser must be as clean as possible to minimize the jitter in the output signal.

The SerDes chipset features high integration of functionalities which simplifies board design and saves cost. The lower power increases reliability and longer surrounding chip life, and superior sensitivity saves cost by eliminating the need for additional amplification parts. Optimal power performance ratios, excellent jitter performance, and support for enhanced FEC applications with up to 30 percent overhead processing makes the Intel LXT16768/16769 chipset ideal for Long-Haul/Ultra Long-Haul transmission.



System Application Layout

LXT16768 DeMUX

Features	Benefits
▪ Dual Power Supply: +1.8V/+3.3V	▪ Optimal power consumption
▪ Power Dissipation: 0.85W	▪ Helps ensure stability and reliability, as well as longer surrounding chip life
▪ Features operation ranges: Option/01: 11–12Gbps Option/02: 12–13Gbps	▪ Supports overhead processing from 10%–30% for extended OTN applications
▪ Interfaces to IXF30007 EFEC for support of up to 30% overhead processing for 9dB improved system sensitivity	▪ LXT16768/69 and IXF30007 are key components for LH/ULH DWDM transmission systems
▪ Integrated LIA, CDR, and DeMux	▪ Superior input sensitivity saves cost by eliminating the need for additional amplification parts
▪ Adjustable decision threshold control	▪ Improves overall system sensitivity with optimized sampling point for asymmetric input signal
▪ 132 PBGA Package	▪ Small physical form factor (13x13mm) supports reduced board space
▪ OIF SFI-4 Compliant Interface	▪ Secures interoperability between DeMUX (receiver) and Framer

LXT16769/59 MUX

Features	Benefits
▪ Single Power Supply: +3.3V	▪ Easy board design and integration
▪ Power Dissipation: 0.85W/0.95W	▪ Ensures stability and reliability, as well as longer surrounding chip life
▪ Features operation ranges: Option/01: 11–12Gbps Option/02: 12–13Gbps	▪ Supports overhead processing from 10%–30% for extended OTN applications
▪ Interfaces to IXF30007 EFEC for support of up to 30% overhead processing for 9dB improved system sensitivity	▪ LXT16768/69 and IXF30007 are key components for LH/ULH DWDM transmission systems
▪ 132 PBGA Package	▪ Small physical form factor (13x13mm) supports reduced board space
▪ 2-bit FIFO combined with dynamic phase alignment based on PLL	▪ High phase margin tolerance
▪ LXT16759 features full or half rate clock output	▪ Enables retiming the laser driver and RZ coding for reducing dispersion at LH/ULH transmission lines

Key Applications

11–12Gbps or 12–13Gbps receivers/transmitters
Long-Haul/Ultra Long-Haul Optical Networking Equipment

- Extended Optical Transport Networking (OTU2V which is specifying higher than 7% overhead processing)
- DWDM line system
- Enhanced Forward Error Correction (EFEC)
- Terrestrial backbone telecommunication systems
- Submarine telecommunication systems
- Test equipment

Support Collateral/Tools

Item	Description	Order Number
■ Data Sheet	LXT16768 11–13Gbps Deserializer	250222-001
■ Data Sheet	LXT16769 11–13Gbps Serializer	250223-001
■ Data Sheet	LXT16759 11–13Gbps Serializer	250285-001
■ Data Sheet	LXD70768/69 Evaluation Board	250456-002

Intel Advantage

- Providing world-class optical components and solutions for multi-protocol and multi-rate networks
- Using leading-edge technologies and manufacturing capabilities to provide high-volume, low-cost optical offerings
- Wide range of optical solutions that accelerate services deployment, reduce costs, and ease migration to higher bandwidth

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