10 Gbit/s Ethernet XENPAK Transceiver
10GBASE-LR (λ=1310 nm)

PRODUCT BRIEF

DESCRIPTION

Optillion 10 Gbit/s Ethernet Fiber Optic Transceiver module TOP 3010-LC (λ=1310 nm) is a highly integrated Ethernet PHY, that provides high-speed serial links at an optical signaling rate of 10.3 Gbit/s. Optillion Ethernet modules are compliant with IEEE 802.3ae draft standard.

These modules are Hot Swappable and permit easy configuration in manufacturing and field for different transmission distances. Extensive test- and management features ease design integration and field maintenance.

The interface to the MAC is a four lane XAUI electrical differential link operating at 4x3.125 Gbit/s. Optillion modules are Class 1 laser safe products, designed according to Telcordia GR-468-CORE for reliability.

APPLICATIONS

- Ethernet metro/aggregation switches.
- Edge/core routers.
- Communication test equipment.

KEY FEATURES

- Highly integrated Ethernet PHY.
- True system "Hot-Swappable".
- Configurable through MDIO.
- Extensive Built-In Self-Test.
- Small footprint.
- Low power consumption 5 W.
- Standard +3.3 V and +5.0 V supply.
- Allows extended traces on PCB.
- Built in back plane transceivers.
- No fiber pigtails, LC™ receptacles.
- Low connector pin count (70).

BENEFITS FOR EQUIPMENT MANUFACTURERS

- Hot Swappable concept for ease of design and manufacturing.
- Shelf distributed 10 GbE I/O ports.
- Miniaturized, low power modules.
- XENPAK multi-sourced form factor.

BENEFITS FOR SERVICE PROVIDERS

- Ethernet transmission up to 10 km over single mode fiber.
- Field configurable on-line.

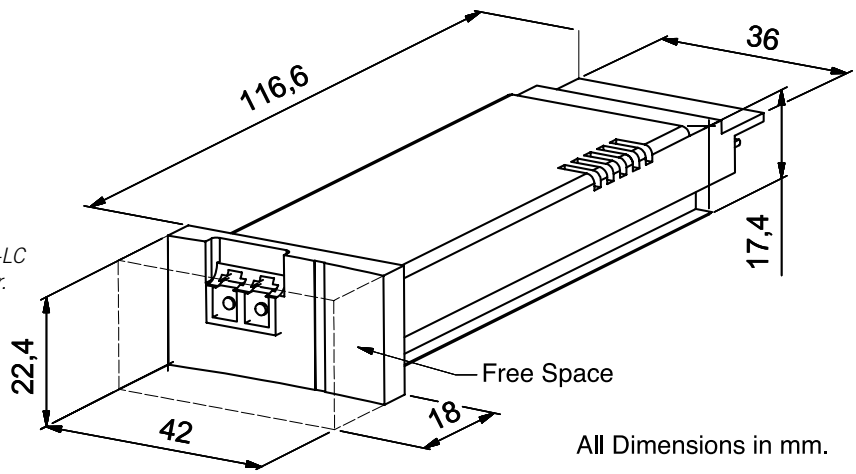

Figure 1 –Mechanical outline for TOP 3010-LC 1310 nm single mode fiber optic transceiver.

FUNCTIONAL DESCRIPTION

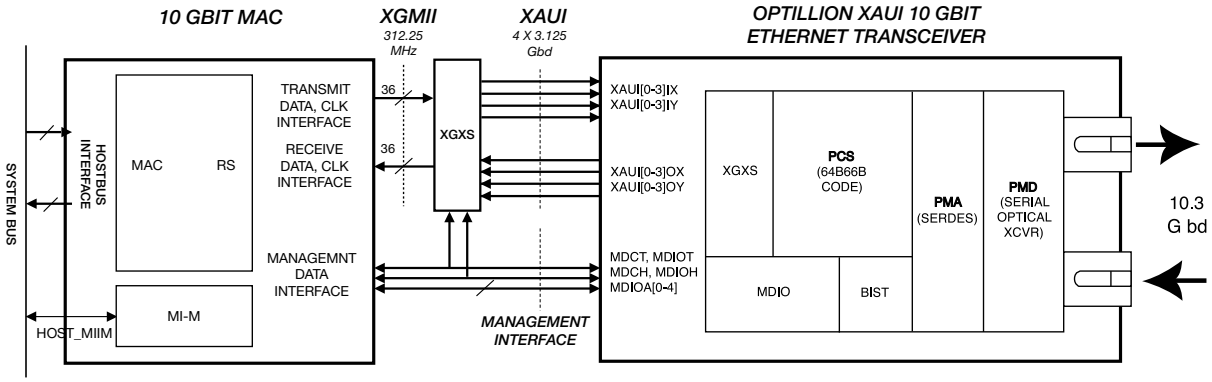

Figure 2 – System connection environment for TOP 3010-LC.

TRANSMIT PATH

The 10 Gbit/s Ethernet compliant 4 bit wide XAUI data is received into a serial to parallel converter (XGXS). The clock is recovered at a data rate of 3.125 Gbit/s per channel. 8B/10B decoding is done and the data is passed on an internal interface to the TX part of the PCS. The PCS does error detection on the data and 64B/66B encoding and scrambling. The data is converted further from wide internal parallel to high-speed serial stream in the PMA serializer and pass data to the laser driver, which drives the PMD laser. The laser and laser driver is kept at correct drive levels by a feedback loop with a monitor.

RECEIVE PATH

The detector diode is detecting the incoming light. The output from the diode is amplified in the PMD. The clock is recovered and the PMA deserialize the incoming data and forward data to the RX part of the PCS. After frame synchronization (frame lock acquired) and descrambling, decoding of the 64B/66B encoded data is done to an internal parallel interface after clock rate adaptation.

The data is passed to XGXS. The encoder does an 8B/10B encoding, and data is sent out on the XAUI output.

ADDITIONAL FUNCTIONALITY

An MDIO interface is available for communication of transceiver status to for example a device processor. The MDIO implements the relevant addresses, status and preference registers (XGXS, 64B/66B PCS and PMA). Optionally tailored functionality may include:
Built-In Self Test, with or without external fiber loop back, with or without external XAUI loop back, BER measurements on specific bit patterns, limited programmable bit patterns for measurements at PMD level. Loop backs in many different configurations (RX-fiber to TX-fiber, TX XAUI to RX-XAUI, loop back at XGXS to PCS interface and vice-versa), programmable LED control output from status registers including AND/OR of masked status registers and direct LED control via MDIO.

Note: Latest information about the XENPAK MSA and detailed specifications: www.xenpak.org

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