

XTM SERIES

GIGABIT ETHERNET MUXPONDER

Effective Layer 1 Aggregation of Ethernet Traffic

The **Double-Dual GbE Muxponder (TPDDGBE)** is a powerful part of the Infinera XTM Series, enabling cost-efficient transport of Ethernet traffic. The TPDDGBE is based on the Intelligent WDM (iWDM[®]) concept in which the same hardware unit can be configured for different functional behaviors to reduce the total cost of ownership (TCO) for an operator.

Optimized for Ethernet Backhaul Applications

The TPDDGBE is a generic traffic unit that is ideal in access and metro networks for backhaul Ethernet traffic. It is especially suitable in asymmetric digital subscriber line (ADSL)/digital subscriber line access multiplexer (DSLAM) and triple-play backhaul networks. The TPDDGBE has two individual dual Ethernet aggregation functions on the same board. Each of the two functions performs TDM of two Gigabit Ethernet (electrical or optical) or Fast Ethernet (electrical) signals onto one wavelength channel with a line rate of 2.488 Gb/s.

All client interfaces use SFPs, enabling each client connection to be adapted to the type of interface, such as single-mode (SM), multi-mode (MM), electrical, etc. as well as distance to the client equipment. Each aggregation function has two SFP-based line ports that provide sub-50 ms 1+1 line protection simply by inserting a second SFP and configuring the unit via the graphical user interface.

Pluggable transceivers provide valuable flexibility, since the TPDDGBE can be used in both CWDM and DWDM networks by selecting the appropriate type of SFPs.

Simplified Management Via iWDM

iWDM wraps the client signals of the TPDDGBE into a digital frame. This digital frame has overhead bytes that carry the management channels, and it also provides quality control of the transmission via performance data. The embedded management channel simplifies management of an XTM Series network because management access is provided wherever there is a traffic connection.



Key benefits:

- Cost-efficient aggregation of Ethernet traffic on to a 2.5 Gb/s line signal
- Protected configurations enabled by dual line ports
- Remote management and signaling through in-band management
- Technology-agnostic. Pluggable transceivers enable usage in CWDM as well as DWDM networks
- Low power design for low total cost of ownership

Reconfigurable Hardware

For situations in which the line signal must be regenerated to bridge longer distances, the same hardware unit can be initiated into a quad regenerator function.

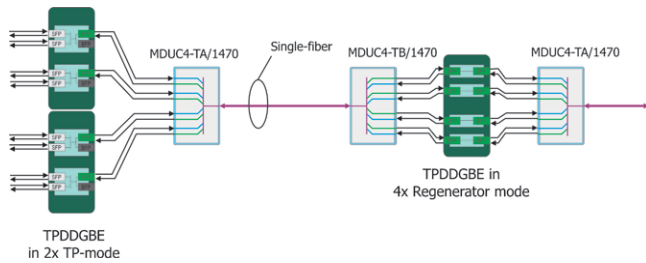


Fig 1. Cascaded Network Example Using TPDDGBE.

The regenerator function enables remote management access to the regenerator site via the embedded management channels.

Tailored Network Element Options

The TPDDGBE can be mounted in the following XTM Series chassis options:

- As a self-managed network element in a 1U TM-102 chassis
- As one of many traffic units in a TM-3000 (10U)/TM-3000II (11U) or TM-301 (3U) chassis

This enables tailored setup in accordance with the current and future capacity needs of the site.

In the TM-102 option, the TPDDGBE initializes the complete Embedded Node Manager (ENM) in the onboard microprocessor, to enable local management simply by connecting any PC or workstation and launching a standard Internet browser. The embedded management channels enable easy remote management via the line signal. Thus, there is no need to provide access to the customer data communication network (DCN) if the GbE muxponder is placed at a customer site.

Networking Examples Prove Flexibility

To show the flexibility of the TPDDGBE, a couple of networking examples are shown in Figures 2 and 3.

DSLAM Collector Networks

The TPDDGBE is ideal for IP/DSLAM collector networks where GbE signals are collected and transported to a hub site. Figure 2 shows how a collector node can be realized using a TPDDGBE mounted in the 1U TM-102 chassis together with an east-west CWDM add-drop filter. This configuration provides four GbE pipes toward the

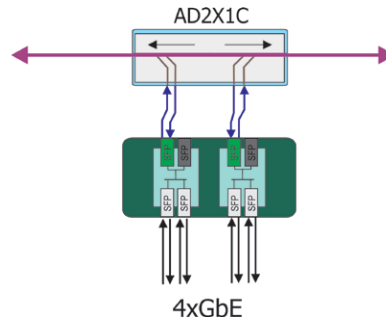


Fig 2. TPDDGBE Is Ideal in IP/DSLAM Collector Networks.

hub node. Protection can be applied in the DSLAM layer via Layer 2 mechanisms, or the 1+1 line protection function can be activated to provide sub-50 ms protection toward the hub.

Broadcast Network

As shown in Figure 3, TPDDGBE can also be configured for IP broadcast. A special broadcast mode is available that enables two GbE-signals to be broadcasted to the satellite nodes in a

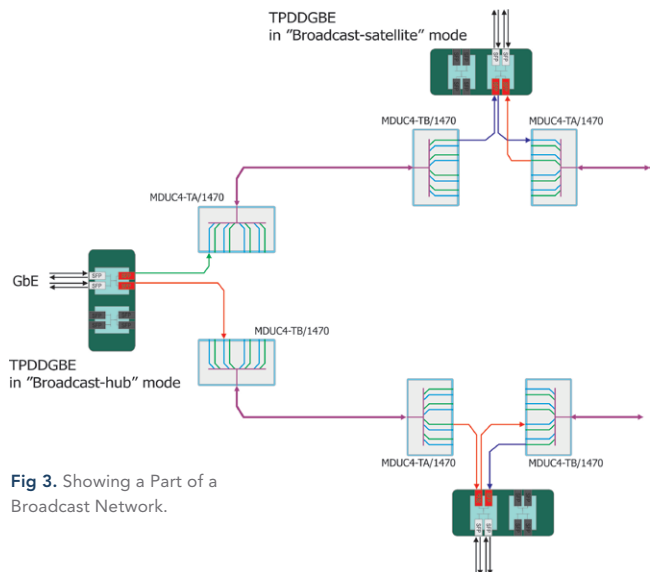


Fig 3. Showing a Part of a Broadcast Network.

ring protection configuration. The protection mechanism provides protection against fiber cuts and node failures. Moreover, the TPDDGBE enables additional satellite nodes to be inserted into a live network.

The second half of the TPDDGBE can be used for bidirectional traffic.

Low Power Design

A fully equipped TPDDGBE consumes less than 26 W. Low power consumption in combination with a small footprint reduces site costs to provide more capacity at sites with restrictions on power consumption, cooling and space.

Specifications

Supported Traffic Formats	Gigabit Ethernet (electrical and optical) Fast Ethernet (electrical)
Layer 1 Performance Monitoring	Gigabit Ethernet: Based on CRC and 8B10B coding errors Line signal: Based on CRC Collected every 15min/24h and presented according to G.826 using ES, SES, etc.
Protection	1+1 Line protection. Non-revertive switching in normal mode, typically <20 ms Revertive switching in Broadcast mode
Power Consumption	Max 26 W worst case (with all client ports active and using DWDM SFPs)
Misc Line Interface Features	Embedded management channels on line signals Trail trace insertion to validate connection
Interfaces	Client interfaces: SFP-based. Supporting MM, SM at 1310 nm/1550 nm, electrical SFPs, etc. Line interfaces: SFP-based. 40-ch DWDM, 8-ch CWDM
Layer 2 Features	GbE utilization PM (in %) per GbE port
Latency	3 μ s end-to-end between two TPDDGBE units

Specifications and Features are subject to change

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