OEM 8-Port EPON OLT Pizza-Box Uplink Interface Subsystem Specification - Official Technical Overview & Hardware Datasheet

OEM 8-PORT EPON OLT PIZZA-BOX UPLINK INTERFACE SUBSYSTEM

OFFICIAL TECHNICAL OVERVIEW & HARDWARE DATASHEET

EXECUTIVE SUMMARY

This document serves as the definitive technical reference for the OEM 8-Port EPON OLT Pizza-Box Uplink Interface Subsystem, a high-density, carrier-grade optical line terminal (OLT) solution engineered for space-constrained Central Office (CO) and distributed access architectures. Leveraging a compact 1RU 'pizza-box' form factor, this subsystem delivers unparalleled 8-port EPON aggregation capacity, integrating advanced uplink interface modules that ensure seamless connectivity to metro Ethernet and IP/MPLS core networks. Designed for system integrators and OEM partners, this platform offers a robust, energy-efficient foundation for Gigabit-capable Passive Optical Network (GPON) and EPON deployments, supporting FTTH, FTTB, and FTTC applications. The subsystem is architected to provide line-rate L2/L3 forwarding, robust Quality of Service (QoS), and comprehensive Operations, Administration, and Maintenance (OAM) capabilities, making it the ideal choice for next-generation broadband access networks.



HARDWARE ARCHITECTURE & SILICON

The OEM 8-Port EPON OLT Subsystem is built upon a high-performance, network-processor-based architecture, integrating a purpose-built switching fabric and forward engine. The central component is a highly integrated System-on-Chip (SoC) that houses the EPON MAC, a non-blocking switch fabric, and a powerful packet forwarding engine. This silicon integration minimizes latency and power consumption while maximizing packet processing throughput. The subsystem features eight (8) independent EPON interfaces, each supporting 1.25 Gbps symmetric bandwidth (1G downlink, 1G uplink) as defined by the IEEE 802.3ah standard. These interfaces are presented via SFP transceiver slots, offering flexible optical reach via industry-standard 1000BASE-PX20 or PX30 optics. The 'pizza-box' chassis is designed with a modular internal backplane that consolidates all power, management, and

high-speed data signals, ensuring signal integrity and high reliability. The subsystem includes a dedicated management CPU complex running a carrier-grade operating system, which abstracts the underlying hardware complexity, providing a uniform interface for control and management plane functions.

KEY FEATURES & ROUTING LOGIC

The OEM 8-Port EPON OLT Subsystem is feature-rich, designed to meet the demanding requirements of service provider networks. Core features include:

- 8-Port EPON Aggregation: Provides eight independent EPON interfaces per 1RU unit, drastically reducing rack space and power per port compared to traditional chassis-based solutions.
- High-Density Uplink Flexibility: Supports a variety of high-speed uplink interface options, including 10-Gigabit Ethernet SFP+ and 40-Gigabit Ethernet QSFP+ modules, allowing for flexible integration with diverse aggregation and core networks.
- Advanced Layer 2/Layer 3 Forwarding: Delivers wire-speed L2 switching and L3 routing, including support for static routing, RIP, and OSPF, enabling efficient traffic segregation and management.
- Comprehensive QoS Capabilities: Implements sophisticated traffic

management and QoS mechanisms, including hierarchical QoS (HQoS) at both the OLT and subscriber levels. This ensures strict Service Level Agreements (SLAs) for voice, video, and data services through traffic policing, shaping, and priority queuing based on 802.1p, DSCP, and MPLS EXP bits.

- Carrier-Grade Reliability: Engineered for high availability with features like LACP, STP/RSTP/MSTP, and support for redundant power supply units. The 'pizza-box' form factor also facilitates N+1 system-level redundancy through straightforward hot-swappable replacement.

- Robust Management & OAM: Offers comprehensive management options, including CLI, SNMP (v1/v2c/v3), and a web-based GUI. Full support for IEEE 802.3-2005 EFM OAM ensures proactive link monitoring and fault detection.

- Energy-Efficient Design: Optimized power supply and thermal design minimize operational expenses, making it an environmentally friendly and cost-effective solution.

- Dynamic Bandwidth Allocation (DBA): Inherent support for DBA per the EPON standard ensures efficient utilization of upstream bandwidth based on ONU reports, optimizing network performance.

COMPLIANCE & STANDARDS

This subsystem is developed and rigorously tested to adhere to a comprehensive suite of industry standards, ensuring interoperability and

regulatory compliance across global deployments. Key standards include:

- EPON Standard: Fully conformant to IEEE 802.3ah (EPON) for physical layer and MAC specifications.
- Ethernet Standards: Meets IEEE 802.3 and 802.1 family of standards, including 802.1Q (VLAN), 802.1ad (QinQ), 802.1p (Priority), and 802.3x (Flow Control).
- Routing & Management: Adherence to relevant RFCs for IP routing protocols (e.g., RFC 2328 for OSPFv2) and management standards (e.g., SNMPv3).
- Safety & Regulatory: Compliant with IEC/EN 60950-1, UL/CSA 60950-1, and GB4943.1 standards for product safety.
- EMC & Environmental: Meets FCC Part 15 (Class A), EN 55022 (Class A), and EN 55024 standards for electromagnetic compatibility. Designed to operate in a wide range of temperature and humidity conditions, suitable for typical telecommunication equipment rooms (NEBS Level 3 optional).
- RoHS & WEEE: Fully compliant with RoHS and WEEE directives, ensuring environmentally responsible manufacturing and recycling.

TECHNICAL SPECIFICATIONS

Parameter	**Specification**
Form Factor	1RU 'Pizza-Box' (19-inch rack-mountable)

Port Configuration	8 x EPON SFP slots (IEEE 802.3ah compliant)
Uplink Ports	2 x 10GE SFP+ slots (optional 40GE QSFP+ upgrade)
Switching Capacity	40 Gbps (Non-Blocking, Full-Duplex)
Packet Forwarding Rate	60 Mpps (64-byte packets)
Dynamic Bandwidth Allocation (DBA)	Integrated DBA support per EPON standard
Management Ports	1 x 10/100/1000BASE-T (Out-of-Band Management), 1 x RJ45 Console Port, 1 x USB Port for file storage
Power Supply	Dual Hot-Swappable Redundant AC (100-240V) or DC (-36 to -72V) PSUs
Max Power Consumption	150W (Typical)
MTBF	> 300,000 hours (predicted per Telcordia SR-332)
Operating Temperature	0°C to 55°C (NEBS compliant: -5°C to 65°C optional)
Storage Temperature	-40°C to 70°C
Dimensions (W x H x D)	440 mm x 44 mm x 480 mm
Weight	7.5 kg (fully populated)

