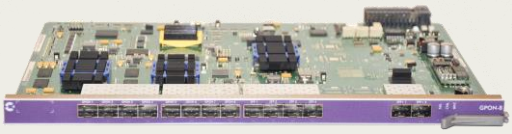
PRODUCT DATASHEET

Calix E7-2 GPON-8

DESCRIPTION

The Calix E7-2 GPON-8 line card provides eight ITU G.984-compliant Gigabit Passive Optical Network (GPON) interfaces, four Gigabit Ethernet (GE) interfaces, and two ports of integrated 10-Gigabit Ethernet. The E7-2 GPON-8 line card can be plugged into one or both of the two universal slots in a Calix E7-2 shelf. In a 1RU chassis, E7-2 supports sixteen PONs, up to 64 Optical Network Terminations (ONTs) for a total of 1024, plus eight point-to-point Ethernet subscribers and two 10GE ports. The E7-2 GPON-8 card supports a full set of Ethernet services and network topology protocols on the Ethernet ports and can be used interchangeably with other E7-2 line cards to create a redundant system configuration.



KEY ATTRIBUTES

GPON AND POINT-TO-POINT ETHERNET: The Calix E7-2 GPON-8 card provides multiservice capability over IP/Ethernet-based networks. Each GPON-8 provides eight GPON OLT ports that subtend up to 64 ONTs each, for a card capacity of 512 GPON ONTs, 1024 per E7-2 1RU chassis. Additional four GE ports per card can provide high-bandwidth, point-to-point Ethernet services to individual subscribers or be used to aggregate other Ethernet devices.

Multiple E7-2 shelves can be linked together using low cost, industry standard 10GE SFP+ copper cables, resulting in a high-density configuration serving over 1000 GPON ONT subscribers in as little as 1RU space (1:64 split). GPON-8 card features and capabilities include:

- Based on ITU G.984 GPON family of standards—including G.988
- GPON: 2.488 Gbps downstream, 1.244 Gbps upstream
- GEM (Ethernet) based GPON
- Interoperable with Calix ONTs, including the GigaFamily
- Integrated 10GE and GE/2.5GE aggregation and transport
- Class B+ ODN, +28 dB link budget, up to 20 km at 32-way splits
- Extended reach GPON up to 40 km with 1:8 split
- Class C+ ODN, +32 dB link budget with Forward Error Correction (FEC), up to 35 km at 32-way split, up to 60 km at 2-way split
- Hardened for central office and remote terminals

INTEGRATED HIGH-CAPACITY AGGREGATION: The E7-2 GPON-8 card is built on a core Layer 2 and Layer 3 switch capable of full-duplex, line rate forwarding at all frame sizes and traffic types across all interfaces. Each GPON OLT port has a dedicated 2.5Gbps switch interface. Industry standard pluggable modules are used for all interfaces, including ITU G.984 compliant GPON, GE and 2.5GE optical SFP, and 10GE SFP+. The SFP+ ports also support SFP modules and Direct Attach copper cables.

IP SERVICES DELIVERY: The Calix E7-2 GPON-8 card delivers a full spectrum of IP access services over GPON and Point-to-Point Ethernet networks.

- Secure AES encryption on the PON
- IPTV – broadcast and Video on Demand (VoD)
- MEF compliant business services
- High-Speed Internet (HSI) access
- Voice – Native SIP/VoIP and TDM Gateway support
- T1 services
- CATV: 1550nm RF video overlay; 1610nmRF return

NETWORK RESILIENCY: All Calix E7cards support a flexible set of standards-based network topology protocols for use in aggregation, ring-based transport, and uplink.

- ITU G.8032 Ethernet Ring Protection Switching (ERPS)
- ITU G.8032v2 Ethernet Ring Protection Switching (ERPS)
- IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)
- IEEE 802.3ad/802.1AX Link Aggregation
- ITU G.983.5 – Type B Protection and enhanced survivability for GPON OLTs

MOBILE BACKHAUL: With integrated network synchronization, hierarchical QoS and support for T1 services, the GPON-8 card transport uncompromised mobile broadband traffic while also supporting triple play residential and MEF certified business services from a single platform. A powerful collection of classification, policing, and scheduling algorithms let operators manage per-subscriber and per-service traffic flows to maintain priority/delay/loss service differentiation within the E7 network.

SCALABLE IPTV SUPPORT: The E7 supports industry standard IGMP snooping to identify and replicate multicast video sent between the set-top box and the video distribution network, providing efficient, scalable, high-quality IPTV distribution on both GPON and Ethernet interfaces.

Calix E7-2 GPON-8

MINIMUM SYSTEM REQUIREMENTS

Calix E7-2 shelf supports two GPON-8 line cards per shelf
Calix E7 Software Release 2.2

DIMENSIONS (W x H x L)

14 x 10.1 x 0.78 inches
35.6 x 25.7 x 2 cm

WEIGHT

2.08 lbs. (0.94 kg)

PORTS

Eight GPON OLT ports
Four SFP ports support optical 1GE/2.5GE and copper 100/1000BaseT modules
Two SFP+ ports supporting 10GE and GE optical modules

PACKET SWITCHING CAPACITY

Wire speed forwarding across all Ethernet and GPON OLT ports
32,000 MAC addresses per system
9,000 byte jumbo frames
2,000 byte frames over GPON
4,096 VLANs
4,000 IGMP Multicast channels

QUALITY OF SERVICE

Service classification based on port, SVLAN-ID, CVLAN-ID, P-Bit
Port and flow-based policing to 1Mbps increments
8 CoS queues per port
Strict priority scheduling with minimum bandwidth guarantee
Congestion avoidance: Tail Drop

STANDARDS AND RFC SUPPORT

TR101 VLAN Service models
IEEE802.1ag Connectivity Fault Management (G.8032 support)
IEEE 802.1D Rapid Spanning Tree
IEEE 802.1p CoS Prioritization
IEEE 802.1 MAC Bridges
IEEE 802.1Q VLAN tagging
IEEE 802.1ad VLAN stacking (Q-in-Q) support
IEEE 802.1w RSTP
IEEE 802.3ad/802.1AX Link Aggregation
RFC 2236 IGMP v2
RFC 3376 IGMP v3
RFC 3046 DHCP Relay Agent Information Option ("Option 82")
RFC 4541 IGMP snooping
RFC 4553 Structure-Agnostic Time Division Multiplexing (TDM) over Packet (SAToP)
ITU-T G.8032 Ethernet Ring Protection Switching (ERPS)/Enhanced EAPS
ITU-T G.8032v2 Ethernet Ring Protection Switching (ERPS)
ITU-T G.984 GPON
ITU G.984.1 Type B Protection
Dynamic Bandwidth Assignment (DBA)
NIST Advanced Encryption Standard (AES)

SYNCHRONIZATION

Synchronization enabled by E7 line cards
External reference timing
Built-in Stratum-3 clock
Hardware-ready to support Synchronous Ethernet

COMPLIANCE

NEBS Level 3 compliance (GR-63-CORE, GR-1089-CORE, GR-3028)
UL 60950
FCC Part 15 Class A
CE Mark

POWER SPECIFICATIONS

GPON-8 power/heat dissipation: 75 Watts

OPERATING ENVIRONMENT

Temperature: –40° to +65° C (–40° F to +149° F)
Humidity: 10 to 95% (non-condensing)

STORAGE ENVIRONMENT

Temperature: –40° to +85° C (–40° F to +185° F)
Humidity: 5 to 95%

CALIX ONTs

The E7-2 GPON-8 card supports all Calix family of ONTs, including 700GX, 700GE, 836GE, 800G GigaFamily, and T-Series ONTs Single Family Unit (SFU), Small Business Unit (SBU), Multi-Dwelling Unit (MDU), and rack-mount models. Calix ONTs support auto sensing GPON and GE network interfaces, allowing service providers to manage service changes without subscriber onsite technical support.

ORDERING INFORMATION

CALIX E7 LINE CARDS

100-03006.....E7-2 GPON-8 (8x GPON OIM, 4x GE SFP, 2x 10GE SFP+)

CALIX PLUGGABLE TRANSCEIVER MODULES

The E7-2 supports pluggable modules for all service and network interfaces. Refer to the Calix Optical Transceiver Modules Datasheet (#250-00191) for a complete list of modules and specifications.

SFP .....1GE and 2.5GE optical and copper Small Form-factor Pluggable (SFP) modules
SFP+ .....10GE optical Enhanced Small Form-factor Pluggable (SFP+) modules
Direct Attach.....Multi-rate copper Small Form-factor Pluggable (SFP/SFP+) cables
GPON OIM.....2.5Gbps GPON (Class B+ ODN with minimum 28dB link budget, up to 1:64 splits)
ER-GPON OIM .....2.5Gbps Extended Reach GPON (up to 58 km with 1:4 split)

Notes:

- For GPON OIM, 10GE XFP, 10GE SFP+ pluggable transceivers and Direct Attach cables, only products purchased directly from Calix are supported. The use of GPON OIM, 10GE XFP, 10GE SFP+ pluggable transceivers and Direct Attach cables not purchased directly from Calix is not supported and will void all product warranties covering the Calix equipment to which such third-party materials are connected.
- SFP modules may also be used in SFP+ sockets at 1GE rate.
- Copper Direct Attach cables can operate in SFP and SFP+ sockets at 1GE, 2.5GE, and 10GE data rates as supported by the card type.