

Calix E7-2 AXOS GPON-8 r2

DESCRIPTION

The Calix E7-2 AXOS GPON-8 r2 line card combines an ITU G.984-compliant Gigabit Passive Optical Network (GPON) card with the AXOS network operating system built specifically for the needs of the access network to accelerate time-to-revenue, eliminate service disruptions, and reduce operational complexity for service providers. The Calix E7-2 AXOS GPON-8 r2 line card provides eight ITU G.984-compliant GPON interfaces, eight Gigabit Ethernet (GE) CSFP ports (four CSFP sockets which also support SFP modules), and four ports of integrated 10-Gigabit Ethernet (two XFP ports, two SFP+ ports).



KEY ATTRIBUTES

GPON AND POINT-TO-POINT ETHERNET: The Calix E7-2 AXOS GPON-8 r2 card provides multiservice capability over IP/Ethernet-based networks. Each GPON-8 r2 provides eight GPON OLT ports that subtend up to 128 ONTs each, for a card capacity of 1024 GPON ONTs, or 2048 per E7-2 1RU chassis. An additional four SFP/CSFP sockets per card can provide high-bandwidth, point-to-point Ethernet services to individual subscribers or be used to aggregate other Ethernet devices. The Calix E7-2 GPON-8 r2 card can co-exist with other Calix E7-2 AXOS line cards in a shelf.

GPON-8 r2 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
- 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 AXOS GPON-8 r2 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, 10GE XFP, and 10GE SFP+. The GPON-8r2 supports (4) CSFP (Compact SFP) modules that are mechanically compatible with the industry-ubiquitous SFP module. Each CSFP module supports two independent bidirectional transceivers (1490nm Tx / 1310nm Rx), each capable of operating at a 1 Gbps bi-directional rate. The SFP+ ports also support SFP modules and Direct Attach copper cables.

IP SERVICES DELIVERY: The Calix E7-2 AXOS GPON-8 r2 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 E7-2 AXOS GPON-8 r2 cards 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 E7-2 AXOS GPON-8 r2 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.

SPECIFICATIONS

Calix E7-2 AXOS GPON-8 r2

MINIMUM SYSTEM REQUIREMENTS

Calix AXOS Software Release 3.1.3

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

8 GPON OLT ports
8 CSFP 1GE ports (4 CSFP sockets, also support SFP modules)
2 SFP+ ports supporting 10GE and GE optical modules
2 XFP ports supporting 10GE optical modules

PACKET SWITCHING CAPACITY

Wire speed forwarding across all Ethernet and GPON OLT ports
64,000 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 1 Mbps 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, IEEE 1588v2

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 r2 power/heat dissipation:
85 Watts (Maximum)
75 Watts (Typical)

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%

