

# Calix E7-20 GPON-16x

## DESCRIPTION

The Calix E7-20 GPON-16x line card provides sixteen ITU G.984-compliant Gigabit Passive Optical Network (GPON) Optical Line Terminal (OLT) interfaces. The E7-20 GPON-16x line card operates in any of the E7-20 system's 20 universal line card slots, for a system capacity of 320 OLT ports. Each OLT PON can support up to 128 Optical Network Terminations (ONTs). Each GPON-16x line card supports a total of 1,024 subscribers, and 10,240 per E7-20 system.



## KEY ATTRIBUTES

**GPON:** The Calix E7 GPON-16x card provides multiservice capability over IP/Ethernet-based networks. Each GPON-16x provides 16 GPON OLT ports that subtend up to 128 ONTs each. There is a card capacity of 1024 GPON ONTs per card, or 10,240 per E7-20 chassis. Subscriber services are aggregated to the central Switch Control Processor (SCP2-10GE) for network connectivity at rates up to 160Gbps. When used in conjunction with the 100GE uplink card network connectivity rates are up to 360Gbps. GPON-16x card features and capabilities include:

- Based on ITU G.984 GPON family of standards
- GPON: 2.488 Gbps downstream, 1.244 Gbps upstream
- GEM (Ethernet) based GPON
- Interoperable with Calix 700, 800 and T-series family of ONTs
- Class B+ ODN, +28 dB link budget, up to 1:64 splits
- Extended reach GPON up to 40 km with 1:8 split
- Class C+ ODN (as per G.984.2 Amendment 2), +31 dB link budget, up to 1:128 splits

**IP SERVICES DELIVERY:** The Calix E7 GPON-16x card delivers a full spectrum of IP access services over GPON networks.

- IPTV – broadcast and Video on Demand (VoD)
- MEF 2.0 compliant business services
- High-Speed Internet (HSI) access
- Voice – Native SIP/VoIP and TDM Gateway support
- T1 services
- CATV: 1550nm RF video overlay; 1610nm RF return

**NETWORK RESILIENCY:** All Calix E7-20 cards are part of a system that supports a flexible set of standards-based network topology protocols for use in aggregation, ring-based transport, and uplink.

- ITU G.8032v2 Ethernet Ring Protection Switching
- ITU G.8032 Ethernet Ring Protection Switching (ERPS)
- IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)
- IEEE 802.3ad/802.1AX Link Aggregation
- ITU G.984.1 – Type B Protection and enhanced survivability for GPON OLTs

**MOBILE BACKHAUL:** With integrated network synchronization, Synchronous Ethernet, Ethernet OAM: IEEE 802.3ah, 802.1ag, and ITU-Y.1731, and support for T1 services, the GPON-16x card can be used to transport uncompromised mobile broadband traffic while also supporting triple play residential and MEF 2.0 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 E7-20 supports industry standard IGMP Proxy 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 E7-20 GPON-16x

### MINIMUM SOFTWARE RELEASE

Calix E7-20 shelf support only  
Calix E7 Release 3.1

### DIMENSIONS (W x H x D)

14 x .78 x 10.1 inches  
(35.6 x 2 x 25.7 cm)

### WEIGHT

2.25 lbs. (1.0 Kg)

### PORTS

16 GPON OLT ports

### PACKET SWITCHING CAPACITY

9000 byte frames over GPON  
4,094 VLANs per system  
4,096 IGMP Multicast channels

### QUALITY OF SERVICE

Service classification based on port,  
SVLAN-ID, CVLAN-ID, p-bit  
Port and flow-based policing to  
64Kbps increments  
Congestion avoidance: Tail Drop

### STANDARDS AND RFC SUPPORT

TR101 VLAN Service models IEEE  
802.1p CoS Prioritization IEEE  
802.1 MAC Bridges  
IEEE 802.1Q VLAN tagging  
IEEE 802.1ad VLAN stacking  
(Q-in-Q) support  
RFC 2236 IGMP v2  
RFC 3376 IGMP v3  
RFC 3046 DHCP Relay Agent  
Information Option ("Option 82")  
RFC 4541 IGMP Proxy  
RFC 4553 Structure-Agnostic Time  
Division Multiplexing (TDM) over  
Packet (SAToP)  
ITU-T G.984 GPON  
Advanced Encryption Standard  
(AES)  
Forward Error Correction (FEC) in  
compliance with Extended Reach  
C+ Optics  
ONTs per OLT port: 128 ONTs  
ITU-T G.984.1 Type B Protection

### SYNCHRONIZATION

External reference timing  
Built-in Stratum-3 clock  
Sync E, 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 AND HEAT DISSIPATION

GPON-16x power consumption:  
104 Watts  
Heat dissipation: 266.15 BTU/Hour

### OPERATING ENVIRONMENT

Temperature: -5° to +55° C  
(23° F to +131° 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 GPON OLT cards support operation with the Calix 700GE, 700GX, 836RSG, 800 Giga Centers and T-series ONTs including Single Family Unit (SFU), Small Business Unit (SBU), Multi-Dwelling Unit (MDU), and rack-mount models.

## ORDERING INFORMATION

### CALIX E7 LINE CARD

100-04194..... E7-20 GPON-16x card (16x GPON ports)

### CALIX OPTICAL AND COPPER PLUGGABLE MODULES

Calix offers a full suite of pluggable GPON Optical Interface Modules for OLT line cards.

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 40 km with 1:8 split)

**Note:** For GPON OIM, 10GE SFP+, 40 GE QSFP+ and 100GE CFP2 pluggable transceivers and Direct Attach cables, only modules purchased directly from Calix are supported. The use of GPON OIMs 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.

