PRODUCT DATASHEET

700GE Optical Network Terminals

DESCRIPTION

Calix 700GE optical network terminals (ONTs) are 2.5 Gbps GPON and 1.0 Gbps Active Ethernet (AE) ONTs that deliver a wide array of information, communication and entertainment services over fiber. These high-performance ONTs set the standard with two or four Gigabit Ethernet (GE) interfaces that provide unmatched IPTV video and data services. The versatile 700GE line of ONTs also features optional 1 GHz RF video with RF return and two or four POTS lines via integrated VOIP or TDM gateway. Calix 700GE ONTs incorporate extensive Internet protocol (IP) functionality into seven ONT models that can be deployed indoors or outdoors.

The 700GE ONTs are designed for the industry-leading Calix C-Series, E-Series and B-Series platforms. Calix 700GE ONTs terminate a GPON or AE fiber link at the subscriber’s location and provide industry-standard interfaces for the customer premises equipment. The ONTs enable subscribers to receive broadband data, IP or RF video, and VOIP or TDM gateway voice on a single fiber. At the ONT, the optical signal is converted to the appropriate electrical signals for transmission over the residence’s existing twisted pair, CAT5, and coaxial cables.

700GE ONTs are easy to install, activate, and maintain. Innovative software management tools allow the service provider to quickly configure, activate and upgrade the ONTs from a remote location. Extensive troubleshooting capabilities, remote software downloads, and easy-to-use service profile menus ensure that services are delivered and ONTs are maintained without needless truck rolls and hardware upgrades.

The Calix 725GE ONT offers an RF return feature for GPON deployments that allows two-way communication between the video headend and the consumer set-top box. RF return path signaling enables many advanced features such as Video on Demand, Impulse Pay-Per-View, and Internet gaming over an RF overlay network. Calix RF return operates in the 5 to 42 MHz RF frequency range and supports set-top boxes meeting Out-of-Band SCTE 55-1, SCTE 55-2, and DOCSIS Set-Top Gateway (DSG) return path standards.

Remote ONT Activation (RONTA) is an innovative software management tool from Calix. RONTA simplifies ONT installation and turn-up by using a basic handset to configure and activate the ONT at the customer premises. The craftsman can install and turn up an ONT without assistance from the central office or use of special equipment.

Calix is also expanding the reach of GPON beyond the traditional 20 km boundary. Extended reach GPON supports links between the ONT and OLT of up to 40 km. This additional coverage allows service providers to edge-out their GPON networks and economically serve sparsely populated outlying locales without adding remote cabinets.

Calix ONTs are hardened to withstand a full range of outdoor temperatures. When placed outside, the ONT is housed in an environmentally sealed enclosure that protects it from the elements. For an indoor installation, the ONT can be mounted on a bracket specially designed for wall-mount and structured wiring enclosure applications.

Outdoor and indoor installations use a 120 Volt, 60 Hz AC power supply that provides battery backup of lifeline POTS in the event of local AC power loss. Battery charge and battery life are monitored and reported through the Calix Management System (CMS).
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KEY ATTRIBUTES

- Standards-based Full Service Access Network (FSAN), ITU-T GPON and IEEE AE compliant
- 2.5 Gbps GPON and 1.0 Gbps AE, with auto-detect optics enables a seamless transition between WAN interfaces
- Two or four Gigabit Ethernet (GE) interfaces with symmetrical GE bandwidth for IPTV and data services
- RF video bandwidth to 1 GHz for extended digital programming
- RF return for reverse path communication — GPON only
- A variety of configuration options provide:
  - VOIP or TDM POTS, two or four lines via integrated SIP IAD or H.248 MG, MGCP, GR-303, TR-08 mode II, GR-57 TDM gateway
  - Two or four 10/100/1000 BASE-T Ethernet interfaces; fully independent for service separation, auto-negotiating
- Indoor and outdoor applications:
  - Outdoor installation features a small, environmentally hardened enclosure that withstands the rigors of the outside plant environment; Telcordia GR-49 compliant
  - Indoor installation offers a range of mounting options including: the standard enclosure for added security and protection; a wall-mount bracket for indoor cabinets and indoor wall mounts; a multi-ONT enclosure that houses up to four 700GE ONTs and can be used for indoor or outdoor applications
- Lifeline service power source with in-home battery backup and alarm monitoring
- Complete OAM&P support via Calix Management System (CMS)
- Traffic Management and Quality of Service (QOS):
  - 802.1Q VLANs
  - 802.1P Service Prioritization
  - Q-in-Q Tagging
  - Multiple VLANs
  - Per-Port Rate Shaping
  - Rate Limiting
- MEF-UNI support for Ethernet demarcation applications:
  - MEF EVCs for E-Line and E-LAN
  - L2-VPNs using MEF service models

SERVICES SUPPORTED

Calix 700GE ONTs deliver high-speed data, POTS, IPTV, and RF video.

- Supports voice, video and data services on a single fiber
- Voice: Two or four VOIP or TDM POTS lines, via SIP IAD or H.248 MG, MGCP, GR-303, TR-08, GR-57 TDM gateway, full lifeline telephony support (CLASS and E911)
- Video: IPTV—supports IGMP multicasting and proxy; RF video—supports analog and digital RF video to 1 GHz; optional RF return
- Data: Two or four 10/100/1000 BASE-T Ethernet ports with service separation and GE bandwidth
SPECIFICATIONS

700GE Optical Network Terminals

MECHANICAL—OUTDOOR ENCLOSURE
Height: 12 in (30.48 cm)
Width: 10 in (25.4 cm)
Depth: 4 in (10.16 cm)
Outdoor installed height: 50–60 in (1.3 to 1.5 m) above ground
Installed weight: 4 lbs (1.76 kg)

RECOMMENDED OUTDOOR CLEARANCES
Left side: 12 in (30.48 cm)
Right side: 6 in (15.24 cm)
Front: 36 in (91.44 cm) standing room
Rear: None

PON CHARACTERISTICS
Max. split: 64 GPON
Max. reach: 40 km (25 miles)
Maximum Attenuation:
GPON – Class B+, 28 dB
1490 ± 10 nm optical receiver:
–27.0 to –8.0 dBm,
–26.5 to –7.5 dBm (725GE ONT)
1310 ± 50 nm optical transmitter:
0.5 to 5.0 dBm,
0.0 to 4.5 dBm (725GE ONT)

POINT-TO-POINT (AE) CHARACTERISTICS
Max. reach: 50 km (31 miles)
1490 nm optical receiver:
–22.0 to –3.0 dBm
1310 nm optical transmitter:
–5.5 to 0.0 dBm

INTERFACES
Telephony: Binding post
Data/IPTV: 10/100/1000 BaseT Ethernet ports, RJ-45 connectors
RF Video: F-connector, 75 Ohms
AE/PON: Single 9/125 µm (single mode) fiber, SC/APC connector, minimum 50 dB return loss
Power: Screw-down terminal block plug

TELEPHONY
General: POTS via SIP IAD, H.248 MG, MGCP or TDM gateway
Number of lines: 2 or 4
RENs per line: 5 maximum
RENs per unit: 10 maximum
Subscriber premises—physical connection: 22 or 24 AWG twisted pair binding posts;
premises isolating RJ-11 test jack (one per line)
Drop length: Maximum 1000 feet (305 m) using 26 AWG wire
Input impedance: 600 Ohms
DS0 Output: 25 mA
Ring Voltage: 56–84 VAC

DATA
Drop length: 328 feet (100 m) maximum using CAT5 cable
Auto MDI/MDIX crossover for 1000BASE-TX, 100BASE-TX, and 10BASE-T ports
Traffic Management and QOS: 802.1Q VLAN; 802.1P Voice, Video, Data and Management Priorities; Q-in-Q tagging; Per-Port Rate Shaping; Rate Limiting

VIDEO—ANALOG RF OUTPUT (GPON)
Bandwidth: 54 to 550 MHz
Return loss: 10 dB minimum
Signal strength (within AGC range): 18 ± 2 dBmV
Flatness: ± 1.0 dB
Tilt: 1.0 dB ± 1.0 dB from 54 to 550 MHz
Channel loading: Analog RF CATV – up to 80 channels
CNR: 48 dBc minimum
CSO: –53 dBc maximum
CTB: –53 dBc maximum
Hum modulation: 1% maximum

VIDEO—DIGITAL RF OUTPUT (GPON)
Bandwidth: 550 to 1003 MHz
Return loss: 8 dB minimum
Signal strength (within AGC range): 12 ± 2 dBmV
Flatness: ± 1.0 dB
Tilt: 4.0 dB ± 1.0 dB from 550 to 1003 MHz
Channel loading: Digital Video – over 740 channels (SD)
Modulation error ratio (MER): 35 dB
Group delay: 20 ns (within 6 MHz span)

VIDEO—REVERSE PATH RF INPUT (GPON)
Bandwidth: 5 to 42 MHz
Compatibility:
SCTE 55-1
SCTE 55-2
DOCSIS Set-Top Gateway (DSG)

VIDEO PON—OPTICAL INPUT (GPON)
Wavelength: 1555 ± 5 nm
Signal strength at 3.4% OMI (AGC range): –5.0 to 2.0 dBm
–4.5 to 2.5 dBm (725GE ONT)

VIDEO PON—OPTICAL OUTPUT (GPON)
Wavelength: 1610 ± 5 nm
Optical output power: –0.5 to 2.5 dBm (725GE ONT)

VIDEO PON—ANALOG RF OUTPUT
Bandwidth: 54 to 550 MHz
Return loss: 10 dB minimum
Signal strength (within AGC range): 18 ± 2 dBmV
Flatness: ± 1.0 dB
Tilt: 1.0 dB ± 1.0 dB from 54 to 550 MHz
Channel loading: Analog RF CATV – up to 80 channels
CNR: 48 dBc minimum
CSO: –53 dBc maximum
CTB: –53 dBc maximum
Hum modulation: 1% maximum

VIDEO—REVERSE PATH RF INPUT (GPON)
Bandwidth: 5 to 42 MHz
Compatibility:
SCTE 55-1
SCTE 55-2
DOCSIS Set-Top Gateway (DSG)

Calix
SPECIFICATIONS

700GE Optical Network Terminals

ENVIRONMENTAL

- Operating temperature: Indoor ambient temperature –40 to 149°F (–40 to 65°C), Outdoor ambient temperature with Calix enclosure –40 to 114°F (–40 to 46°C) plus solar load
- Rate of change in operating temp: 15°F (8.3°C) per hour maximum
- Shipping and storage temperature: –40 to 140°F (–40 to 60°C)
- Operating/storage relative humidity: 0 to 95 % non-condensing
- Altitude: –200 to 10,000 feet (–61 to 3,048 m) above sea level
- Misc: Salt fog resistant; wind-driven rain protection; anti-dust enclosure

POWER

- Screw-down terminal block plugs for 7-wire alarms and power interface

CERTIFICATION AND COMPLIANCE

- Emissions: FCC Part 15 Class B, IC ICES-003 Class B
- Safety: UL 60950 and UL 1697 approved
- Telcordia: GR-1089, GR-49
- IEEE: 802.3, 802.3AB, 802.3U, 802.1P, 802.1Q
- MEF: 9 and 14

RESIDENTIAL BATTERY BACKUP

- Residential battery backup source (local): UPS mounted at subscriber’s home
- Power termination: Maximum length of 70 feet (21.3 m) DC power and alarm cable with seven 16/24 AWG conductors connected to a UPS
- Input voltage: 12 VDC (nominal)
- Input current: 750 mA (nominal)
- Battery backup time rated capacity: 8 hours based on Telcordia GR-909 calculation methods using recommended UPS. Contact Calix for recommended UPS.

ORDERING INFORMATION

Calix 700GE Optical Network Terminals

711GE ONT (100-01712) .................. 2 POTS, 2 Gigabit Ethernet
716GE ONT (100-01714) .................. 2 POTS, 4 Gigabit Ethernet
717GE ONT (100-01715) .................. 4 POTS, 4 Gigabit Ethernet
721GE ONT (100-01716) .................. 2 POTS, 2 Gigabit Ethernet, 1RF Video
725GE ONT (100-01719) .................. 2 POTS, 2 Gigabit Ethernet, 1RF Video with RF Return
726GE ONT (100-01720) .................. 2 POTS, 4 Gigabit Ethernet, 1RF Video
727GE ONT (100-01721) .................. 4 POTS, 4 Gigabit Ethernet, 1RF Video

Calix 700GE ONT Enclosures and Wall Mount Bracket

SFU ENCL-ST (100-01578) .................. SFU ONT Enclosure with Splice Tray
SFU ENCL-ST-PP (100-01580) .......... SFU ONT Enclosure with Splice Tray and Primary Protection
SFU ENCL-OA (100-01579) .............. SFU ONT Enclosure with OptiTap Adaptor
SFU ENCL-ST (100-01581) .............. SFU ONT Enclosure with OptiTap Adaptor and Primary Protection
SFU SLACK STRG-NG (100-00986) ... SFU ONT Slack Storage Enclosure SFU-NG
SFU SWEB (100-01409) ................. SFU ONT Wall Mount Bracket