ADTRAN®

Data Sheet

ADTRAN

# 9504N

## Environmentally-Hardened
## 10G-EPON Remote OLT (with DPoE)

| 10 Gbps | FTTH | $ Low TCO | Sealed |

## Benefits

- **Cuts head end space congestion, power consumption and fiber exhaust issues**
- **Supports Gigabit speeds and subscriber capacity via remote, non-blocking FTTH architecture**
- **Up to 512 FTTH subscribers supported via 4-ports of 10G-EPON**
- **Purpose built to support gigabit broadband and SLA-based multi-gig business and backhaul services**
- **Supports low-latency services such as emerging augmented and virtual reality applications**
- **Expedites OSS/IT on-boarding to fully-featured Cable Labs DPoE 1.0 and 2.0 compliant systems**
- **Aligned with Distributed Access Architectures (DAA) and Fiber Deep strategies (up to 80km)**
- **Robust outside plant design with strand mounting and environmentally sealed packaging**
- **Fully redundant power supplies and uplink connections**

## Overview

**The ADTRAN® 9504N is a strand mount OLT designed to be attached to messenger strands to optimize Cable MSO networks with short drops and high split counts.** Built on the latest Layer 3 switch platform with built-in DOCSIS Provisioning over EPON (DPoE) technology, it is a cost-efficient solution for PON-based access networks, optimized for reliable triple-play service and beyond.

The ADTRAN 9504N compact, environmentally-hardened Remote OLT, with built in traffic management features, handles both present and future requirements. As a scalable EPON OLT with DPoE, the 9504N allows network operators to control costs and capacity with a "pay as you grow" platform. The 9504N provides convenient system operation and maintenance via:

- Layer-2 switching
- Layer-3 routing
- Quality of Service (QoS)
- Operations, Administration, and Maintenance (OAM)
- Security features

The 9504N's environmentally hardened, clam-shell form-factor can withstand extreme weather conditions and provide reliable broadband connectivity.

# 9504N

## Product Specifications

### System Features

- 4x 10GE/1GE uplink SFP+ ports
- 4x 1G/1G EPON XFP ports
- Full-duplex switching capacity: 160 Gbps
- System throughput: 53.7 Mpps
- Management interfaces: RS-232C, 10/100/1000BASE-T

### Mechanical

- 15 x 10 x 9 in. (393 x 262 x 248 mm) (W x H x D)
- Maximum Weight: 48.3 lbs (21.9 kg)

### Electrical Power Specification

- Maximum power consumption: 129 W, 440 BTU
- Rated input voltage: 45 - 90 VAC, 50 - 60 Hz

### Environmental

- Operating Temperature: -40°C to 60°C (-40°F to 140°F)
- Humidity: 5 – 95%

### DPoE

- Max 16 bidirectional unicast LLID per 10G ONU
- Max 1K bidirectional unicast LLID per OLT port
- Wire-speed processing
- 10 Gbps/10 Gbps symmetric rate (downstream/upstream)
- 10 Gbps/1 Gbps asymmetric rate (downstream/upstream)
- 128-bit Advanced Encryption Standard (AES) encryption engine for PON security and privacy with up to 128 unique keys.
- AES-128 bidirectional encryption
- Forward Error Correction (FEC) encoding and decoding
- Flexible optical transceiver interfaces for multiple vendor support
- Hardware-based configurable Dynamic Bandwidth Allocation (DBA)
- IEEE 802.1D bridging: 8K MAC Address learning and aging on local interface
- IEEE 802.1p with four priority queues
- IEEE 802.1Q VLAN mapping
- Supports local and remote loopback test, IPDR, lawful intercept, and MEF services
- DPoE 2.0 features including IPv6, multicast, MPLS, IP-SG with sub-bundle interfaces and L2-HSD support

### Layer 2

- MAC address: up to 32K (shared) MAC management
- VLAN
  - Max 4 K VLANs, 802.1Q support
  - 802.1ad Q-in-Q
  - Tagging/stacking
  - Port to VLAN mapping
  - Service to VLAN mapping
- Link aggregation
  - 802.3ad link aggregation
  - Load-balancing based on source and destination MAC/IP
- Spanning Tree
  - 802.1d Spanning Tree Protocol (STP)
  - 802.1w Rapid STP (RSTP)
  - 802.1s Multiple STP (MSTP)

### Security

- Packet Filtering
  - NetBIOS, NBT filtering
  - DHCP filtering
  - Packet filtering with ACLs
  - EtherType VLAN ID
  - Destination/source IP address

### Layer 3

- Routing
  - Static routing
  - RIPv2 (IPv4), RIPng (IPv6)
  - OSPFv2 (IPv4) / v3 (IPv6 )
  - IS-IS
  - BGP4 (IPv4) / 4+ (IPv6 ),
  - VRRPv2 (IPv4) / v3
  - Policy Based Routing (PBR) ECMP max 8 routes: restricted by software—Max 16 K routing entries
- Multicast
  - PIM-SM, PIM-SSM
  - IGMP v2/v3
  - Max. 1K (IPMC) group support ,
  - IGMP snooping , IGMP join/leave, PIM-ECMP support, IGMP join filter/count limit
- DHCP
  - DHCP Relay, Blocks illegal IP users, DHCP option 82, DHCP Snooping, DAI (Dynamic ARP Inspection)
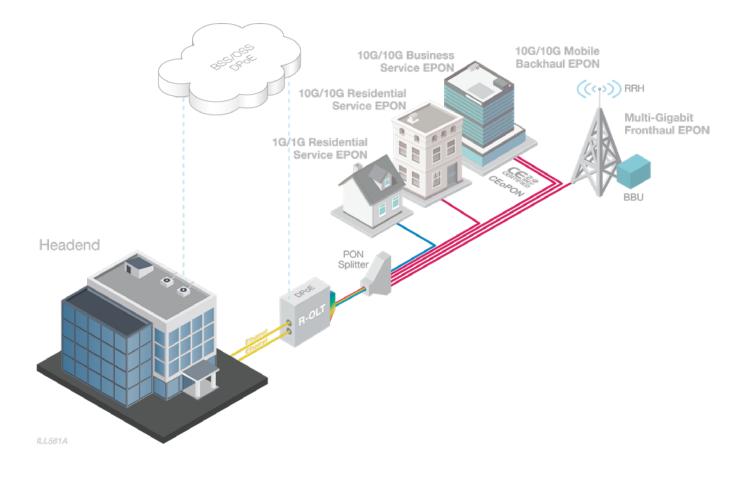
## Quality of Service

- Layer 2: source/destination MAC address, VLAN ID, COS field
- Layer 3: source/destination IP address, DSCP
- Layer 4: source/destination TCP/UDP port
- TCP control flag
- Marking/remarking: DSCP, 802.1p
- Packet drop
- Mirroring to port, redirect to port
- Metering, rate limiting with 1 Mbps unit
- 8 queues per port
- SPQ, DWRR, hybrid (SPQ+DWRR)
- Egress rate shaping per port/queue with 1 Mbps unit
- Abnormal traffic blocking
  - Block the illegal source MAC address
  - ALL 0's, 1's, system Mac, default G/W Mac
  - Block the illegal source IP address storming control
  - Broadcast, DLF, multicast packet rate control
  - Cut-off of illegal traffic per source MAC
- IP anti-spoofing
- ARP packet traffic limit
- Blocking of user-to-user flows
- Subscriber isolation
- MAC address anti spoofing
- User protection: ARP spoofing/ARP cache poisoning—IP spoofing, DHCP spoofing, broadcast flooding, MAC address spoofing, MAC flooding, 802.1Q tagging

## System Security

- Access control: RADIUS; TACACS+; Telnet, SNMP with ACL; DHCP, DHCP 82/60 options, PPPoE (option 105) and static IP
- Protection
- CPU packet filtering with ACL
- CPU overload packet traffic sender block
- TCP sync attack protection with sync cookies
- CPU packet rate-limit

## Management

- Remote access
  - Telnet, SSH, SNMP v1/v2/v3
- OS/configuration
  - Remote OS upgrade using TFTP, FTP
  - Dual flash image
  - Remote configuration data download
- Others
  - NTP
  - Packet monitoring with TCPDUMP
  - RMON, syslog
  - Type-based port, CPU packet statistics

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## Ordering Information

| Equipment | Part No. |
|-----------|----------|
| ADTRAN 9504N Environmentally-Hardened 10G-EPON Remote OLT (with DPoE) | 1759504NF1 |



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