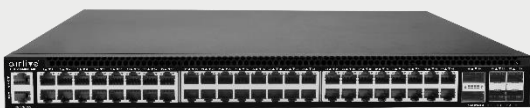


# L3 Managed Multi Giga Switch with 40G uplink

54-Port Multi Giga RJ-45 incl 4x 25/10G SFP28, 2x 40G QSFP+

L3D-2TX4806-40GF

airlive®



|                          |                                     |            |           |
|--------------------------|-------------------------------------|------------|-----------|
| Rich L3 Features         | L3 DHCP Server/Relay                | MLAG       | ACL, ERPS |
| 48 Port RJ45<br>2500Mbps | 25/10G SFP28<br>40G QSFP+<br>Uplink | Datacenter | VxLAN     |

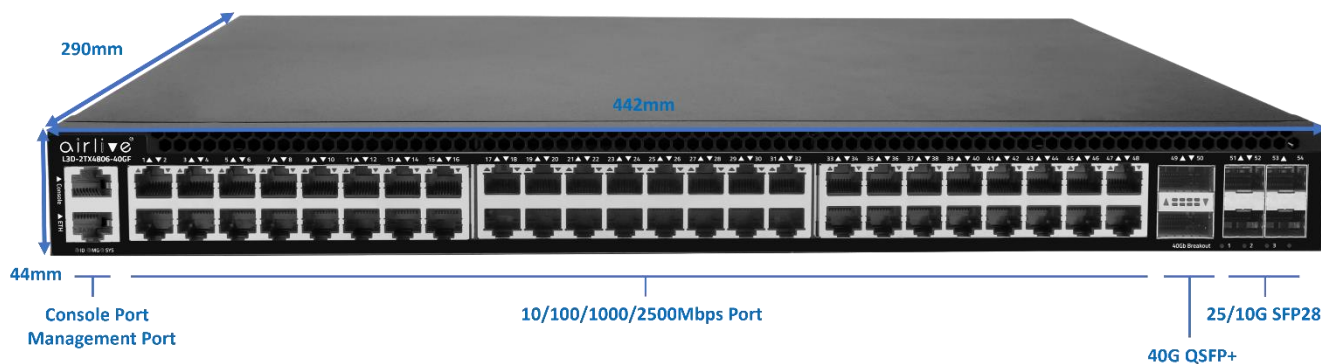
## Overview

### Rich L3 Features with Super High Speed

The L3D-2TX4806-40GF offers high performance full 48 port 2.5G RJ-45 and 4x 10/25G SFP28 & 2x 40G QSFP+ uplink ports in a compact 1U form factor. The AirLive L3D-2TX4806-40GF is ideal for Data Centers, and large network users like campus. Combining advantages of zero packet loss, low latency, and non-blocking performance for lossless Ethernet. The layer 3 switch incorporates rich features, including VXLAN, MLAG, VRRP, etc. for scalable and flexible data center designs.

### What Is a Layer 3 Switch?

A Layer 3 switch is a specialized hardware device used in network routing. Layer 3 switches technically have a lot in common with typical routers, and not only in physical appearance. Both can support the same routing protocols, inspect incoming packets, and make dynamic routing decisions based on the source and destination addresses inside. One of the main advantages of a Layer 3 switch over a router is in the way routing decisions are performed. Layer 3 switches are much low network latency since packets don't have to take additional steps through a router.



## Features

- Rich Layer 3 Features
- Fully L2 features provide easier manageability, security and QoS
- Interconnect across Datacenters based on VxLAN
- VXLAN Layer 2 switching
- ITU-T G.8032 Ethernet Ring Protection Switching (ERPS)
- SNMP, WEB, CLI, RPC-API
- Support Private VLAN, Guest VLAN, Voice VLAN
- IPv4/IPv6 L3 static route, GRE tunnel, NVGRE tunnel
- Clear Status display including traffic, CPU, per-port status
- Web-UI for easy management; CLI and Command Script for advance setting; SNMP used for popular network tools management.

## Major Specifications

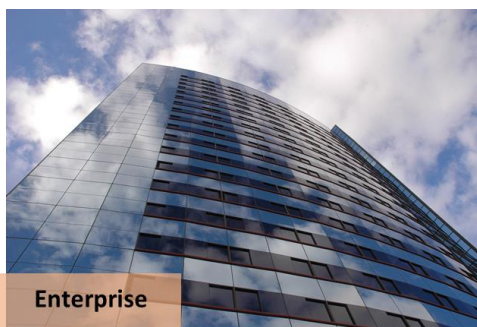
- 48 x 10/100/1000/2500Mbps RJ-45
- 4 x 25/10G SFP28
- 2 x 40G QSFP+ (Breakout Cable 4x 10G Supported)
- High Bandwidth 600Gbps
- 1 x RJ-45 Console and Management port
- Support ACL, RADIUS, TACACS+
- MLAG Virtualization Technology
- Support VRRP
- Authentication: 802.1x, AAA
- DHCP Snooping prevents unauthorized router installed

## Applications of Layer-3 Switches

- Layer-3 Switch is widely used in Data Centers and Universities, factory, enterprise where there is a very big setup of computer networking. Owing to its features like static and dynamic routing and its fast-switching speed than a router, it is used in LAN connectivity for interconnection of several VLAN and LAN networks.
- L3D-2TX4806-40GF have the skills to offload the overloaded routers. This can be done by configuring a Layer-3 switch, each with a main router in a wide area networking scenario so that the switch can manage all the local level VLAN routing.
- The Layer-3 switch in combination with a number of layer-2 switches supports more users to connect on the network without the need for implementation of an extra layer-3 switch and more bandwidth. Thus, it is widely implemented in universities and small-scale industries. In case if the number of end users on a network platform increases, then without any enhancement of the network, it can be accommodated in the same running scenario easily.
- A Layer-3 switch is smart enough to handle and manage the routing and traffic controlling of locally connected servers and end devices utilizing its high bandwidth.



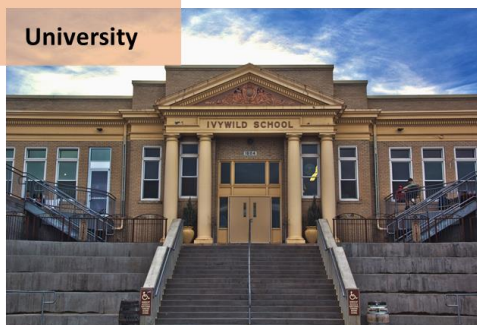
Factory



Enterprise



Data Center



University

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54-Port Multi Giga RJ-45 incl 4x 25/10G SFP28, 2x 40G QSFP+

L3D-2TX4806-40GF

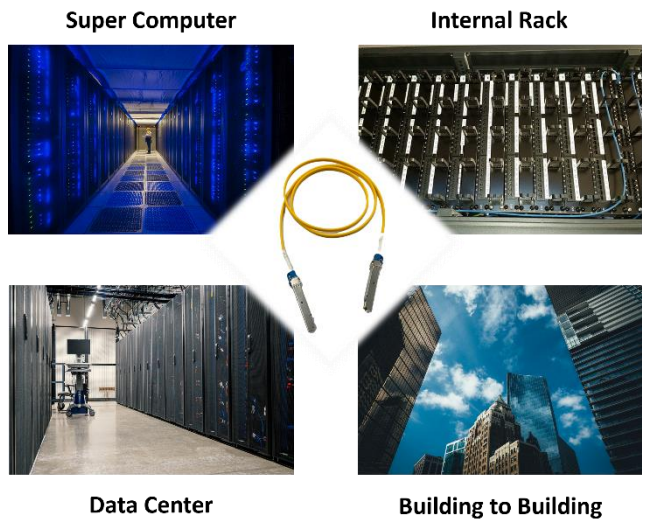


## 10/25/40G Performance and Scalability

With high switching capacity, L3D-2TX4806-40GF support wire-speed L2/L3 forwarding and high routing performance for IPv4 and IPv6 protocols.

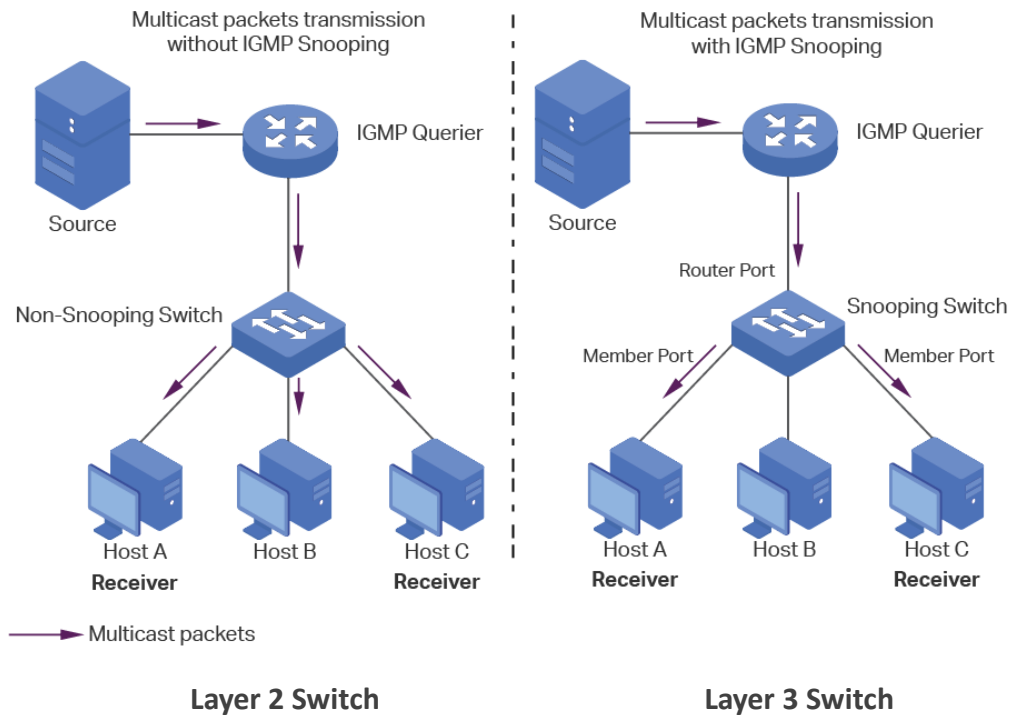
The 10/25/40 Gigabit connectivity of L3D-2TX4806-40GF is accomplished via a hot-pluggable 10/25 Gigabit SFP28 transceiver or a 40G QSFP+ transceiver, which supports distance up to 300 meters over multimode fiber and 10 to 40km over single-mode fiber (The distance and speed depends on the optical module chosen).

## 10/25/40G SFP28/QSFP+ Connect Applications



## Strong L3 IGMP Snooping Multicast

L3 multicast protocols is compliant with IGMPv1/v2/v3 and supports abundant multicast features such as IGMP v2/v3 snooping and fast leave. With Multicast VLAN Register (MVR), multicast receiver/sender control and illegal multicast source detect functions; L3D-2TX4806-40GF fiber series provides a great application experience for the customer.



## Advantages of Using Breakout

The L3D-2TX4806-40GF supports Breakout cable for the 40G port. This feature is particularly significant as networks demand more flexibility and higher bandwidth capabilities.

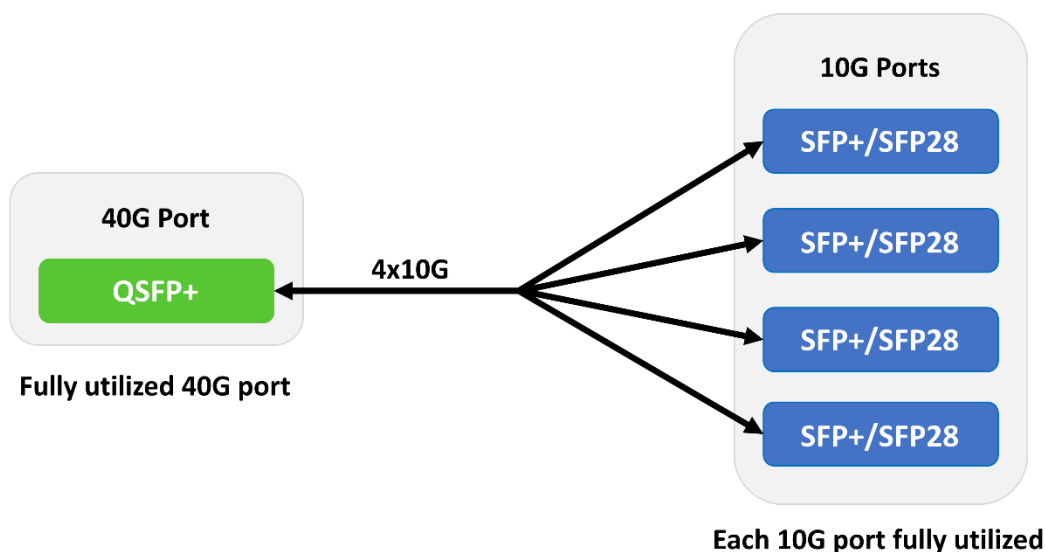
Breakout is a configuration that used the benefit of a high-bandwidth interface and "breaks it out" into multiple lower-bandwidth interfaces. Normally, this configuration applies to Ethernet switches where a high-speed port, such as a 40G QSFP+, is divided into multiple smaller connections, like 4x10G. This subdivision allows network engineers to connect to devices that require lower bandwidth connections while still fully and efficiently using the switch port resources.

Breakout mode is an invaluable feature for data centers transitioning from 10G/25G to 40G/100G networks, as it provides backward compatibility and a smoother migration path.

•**Flexibility:** Breakout allows network builders a varied connectivity for there needs within their network. For example, they can connect switches with 10Gbps ports to a 40Gbps switch without needing to upgrade all equipment to support 40Gbps interfaces.

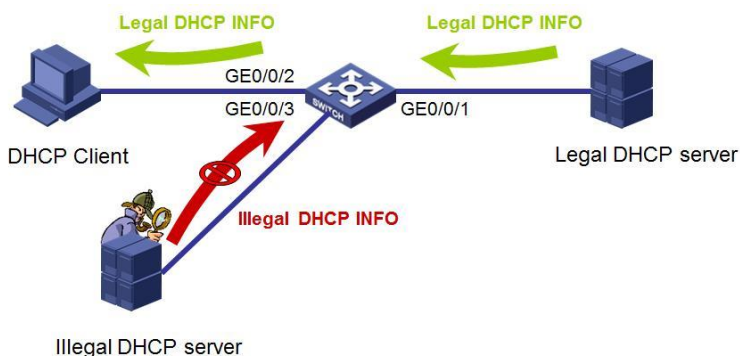
•**Improved Port Utilization:** Instead of leaving a high-speed port underutilized because there aren't enough devices that work at that speed, breakout mode allows the connection of more devices at lower speeds, thereby utilizing the port's full capacity more effectively.

•**Scalability:** As network needs grow or change, breakout mode can help accommodate new devices and configurations without the need for immediate infrastructure rebuilds. This helps in growing the network in a cost-effective manner.



## L3 DHCP Snooping Support

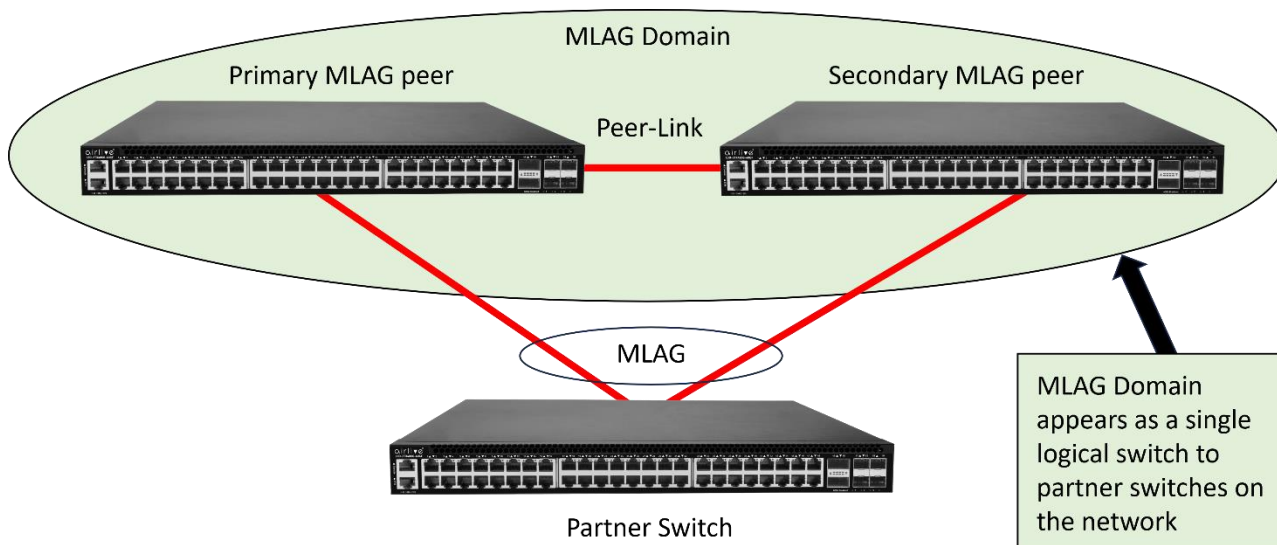
Prevention against illegal Router(DHCP Server) attacks or sending DHCP information.



## MLAG (Multi-chassis Link Aggregation Group)

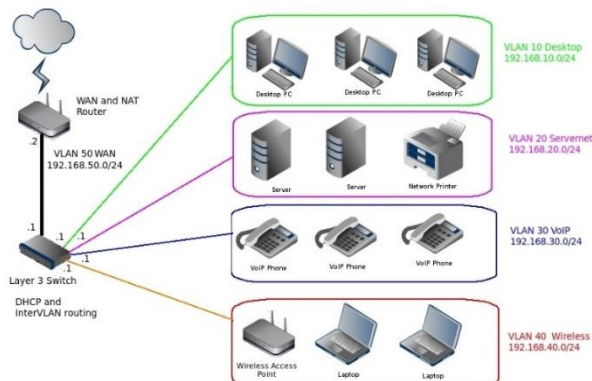
The AirLive L3D-2TX4806-40GF supports MLAG (multi-chassis link aggregation group). MLAG is a non-standard protocol that implements link aggregation among multiple devices. The devices at both ends of the MLAG send MLAG negotiation packets through the peer-link. The main purpose of MLAG is to deliver system-level redundancy in the event one of the chassis fails. MLAG also has strong scalability as the capacity is not limited to a single device. This is very useful in those applications where a network needs to be extended to accommodate more clients. MLAG networks can be expanded without any downtime to the current existing network. Making it a very good solution for those locations where downtime is not wanted. MLAG can be used at various places in the network to eliminate bottlenecks and provide resiliency.

MLAGs provide an active-active split aggregation deployment across two switches acting as one. MLAG creates a more resilient network with higher bandwidth capabilities. The below image shows a basic example of a MLAG Domain. In the example the peer switches are linked together with a special LAG (one or more cables as shown by the "Peer-Link" line in the picture, the peer link's primary purpose is exchanging MLAG control information between peer switches. Any non-management port on the switch can be used in the Peer-Link. With the Peer-Link configured, the two switches appear as a single switch to partner switches upstream and downstream. Each partner switch contains MLAGs that are simply LAGs (link aggregation groups) whose cables are split between the two peers. Primary and secondary peer roles are chosen automatically by the program when MLAG is enabled.



## L3 VLAN IP Routing Interface Management

The L3D-2TX4806-40GF provides 3 layers of VLAN interface, which is used to communicate with network layer devices. VLAN interface is a network layer interface, which can be configured with IP address. Before creating VLAN interface, the corresponding VLAN should be created first. With the help of VLAN interface, switches can communicate with other network layer devices. The ideal solution for enterprises, offers greater security, control and bandwidth conservation, and high-speed uplink. The L3D-2TX4806-40GF supports Guest VLAN, Voice VLAN and QinQ among others.



## VXLAN virtualize your network

The L3D-2TX4806-40GF comes with Virtual eXtensible Local-Area Network, or VXLAN (network virtualization technology standard). It allows a single physical network to be shared by multiple different organizations, or “clients,” without any one client being able to see the network traffic of any other.

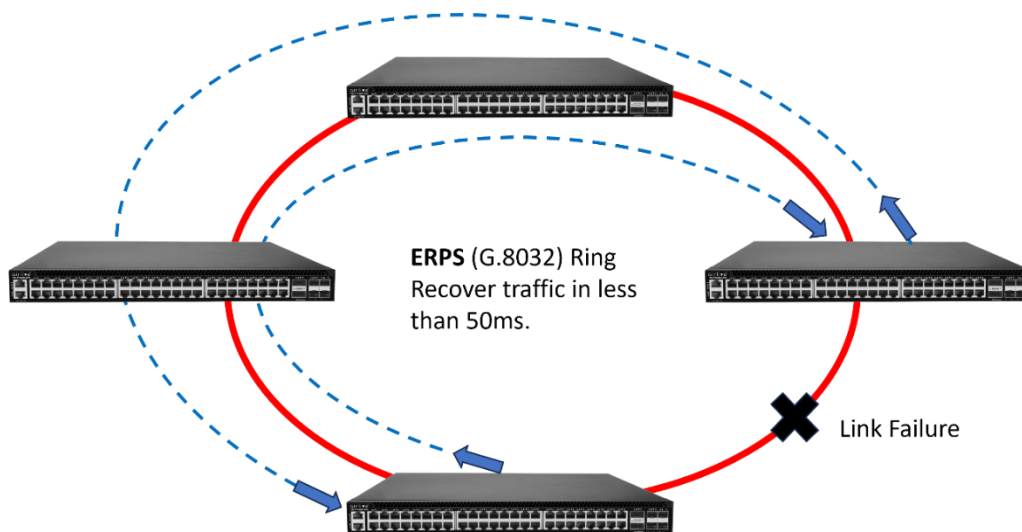
In this way, VXLANs are a discrete, private network segment within a shared physical network.

a VXLAN allows a physical network to be segmented into as many as 16 million virtual, or logical, networks. It works by encapsulating Layer 2 Ethernet frames into a Layer 4 UDP packet alongside a VXLAN header. Because VXLANs are encapsulated inside a UDP packet, they can run on any network able to transmit UDP packets. The physical layout and geographic distance between nodes of the underlying network doesn't matter, as long as the UDP data is forwarded from the encapsulating VXLAN Tunnel Endpoint to the decapsulating VXLAN Tunnel Endpoint.

## ERPS Ethernet Ring Protection

ERPS (G.8032) is supported by the L3D-2TX4806-40GF Switch. ERPS supports multi-ring and multi-domain structures (master and sub rings) and optimizes the inspection mechanism in terms of two-way faults. In addition, it supports main device backups, load sharing and other work methods in <50ms switching.

This means that when multiple switches have been placed in a Ring and the network work is interrupted, it will recover within 50ms or less. Meaning the critical network like in Data centers, Campus networks or automated production lines will be online again with minimum loss of time. The ring network is also protected against loops.



| Model  | AirLive L3D-2TX4806-40GF  |
|--|---|
| <p><b>Hardware</b></p> <ul style="list-style-type: none"> <li>• <b>Device Interface:</b><br/>48 x 10/100/1000/2500M RJ-45 Ports<br/>4 x 25/10G SFP28 Ports<br/>2 x 40G QSFP+ Ports<br/>1x RJ-45 Console Port,<br/>1x RJ-45 External Management Port<br/>54 Port Totale</li> </ul> <p><b>Standard</b></p> <p>IEEE 802.3 : Ethernet MAC Protocol<br/>IEEE 802.3ab : 1000BASE-T Gigabit Ethernet<br/>IEEE 802.3bz : 2.5GBASE-T<br/>IEEE 802.3ae : 10G Ethernet (optical fiber)<br/>IEEE 802.3by : 25G Ethernet (optical fiber)<br/>IEEE 802.3ba : 40/100G Ethernet (optical fiber)<br/>IEEE 802.3x : Flow Control<br/>IEEE 802.3az : Energy Efficient Ethernet<br/>IEEE 802.3ad : Link aggregation<br/>IEEE 802.1ab : LLDP/LLDP-MED (Link Layer Discovery Protocol)<br/>IEEE 802.1p : LAN Layer QoS/CoS Protocol Traffic Prioritization(Multicast filtering function)<br/>IEEE 802.1q : Virtual VLAN<br/>IEEE 802.1x : Client/Server Access Control and Authentication Protocol<br/>IEEE 802.1d : STP<br/>IEEE 802.1s : MSTP<br/>IEEE 802.1w : RSTP <ul style="list-style-type: none"> <li>• <b>LED Indicators:</b><br/>Indicators ID, MG, SYS<br/><b>ID:</b> Off: The ID indicator is disabled and is in the default state. On: This indicator is used for on-site location. O&amp;M personnel remotely control the ID indicator to turn on or off.<br/><b>MG:</b> On: The ETH Port is link up, Off: The ETH Port is link down<br/><b>SYS:</b> On: System normal, Flashing: System startup<br/><b>Port indicator:</b> Flashing: The link is being transmitted. Off: The link is down.</li> <li>• <b>Mechanical</b><br/>Solid metal 19" 1U rack-mountable</li> </ul> <p><b>Power</b></p> <ul style="list-style-type: none"> <li>• <b>Power Input:</b> AC100~240VAC</li> <li>• <b>Power Usages Max:</b> 96W</li> </ul> <p><b>Switch Architecture   Performance</b></p> <ul style="list-style-type: none"> <li>• <b>Switching Performance</b><br/>Bandwidth: 600Gbps<br/>Packet Forwarding Rate: 446Mpps<br/>DDR SDRAM: 8GB<br/>Flash Memory: 2GB<br/>Package cache: 4.5Mbit<br/>MAC Address: 96K<br/>Jumbo frame: 9216Byte<br/>VLANs: 4K<br/>MTBF: 100000 hour</li> </ul> </p> | <p><b>Fiber Medium:</b></p> <p>Multi-mode Fiber: 50/125 、 62.5/125 、 100/140um<br/>Single-mode Fiber: 8/125 、 8.7/125 、 9/125 、 10/125um</p> <p><b>Software Function</b></p> <ul style="list-style-type: none"> <li>• <b>Ethernet:</b><br/>Interface: Ethernet interface operating modes(full duplex, half duplex, and auto-negotiation), Ethernet interface operating rates, Jumbo Frame, port-xconnect<br/>Flow-control: Flow-control tx/rx<br/>Storm-control: Port based storm-control<br/>Port-Block: Port-block(know-unicast/unknow-unicast/know-multicast/unknow-multicast/broadcast)<br/>Port-isolate: L2/L3/All Port-isolate, Uni-direction isolate<br/>L2 Protocol Tunnel: L2 Protocol Tunnel(support CDP/CFM/DOT1X/LLDP/SLOW-PROTO/STP/VTTP<br/>Forward mode: Store-and-forward, Cut-through mirroring, port speed limit, port energy saving</li> <li>• <b>VLAN:</b><br/>VLAN Access Mode: Access/Trunk, Default VLAN<br/>VLAN Classification: VLAN Classification(port based/mac based/IP based/protocol based)<br/>QinQ: Basic QinQ, Selective QinQ, VLAN Mapping (1:1 VLAN Translation)<br/>Support VLAN Statistics, Private VLAN, Voice VLAN, Guest VLAN</li> <li>• <b>MAC:</b><br/>MAC Address Table: Automatic learning and aging of MAC addresses, Hardware Learning, Static and dynamic MAC address entries, Blackhole MAC<br/>Support MAC Flapping detect<br/>Support Port Bridge Snooping</li> <li>• <b>LAG:</b><br/>Link aggregation: Static-LAG &amp; LACP, LAG load balance (SLB), LAG load balance (DLB), LAG load balance (RR), LAG Self-healing</li> <li>• <b>xSTP:</b><br/>STP: Spanning-Tree Protocol<br/>RSTP: Rapid Spanning-Tree Protocol<br/>MSTP: Multi-instance Spanning-Tree Protocol<br/>Spanning-Tree Protocol Protection: BPDU Filter/Guard, Root Guard, Loop Guard, Anti TC-BPDU attack</li> <li>• <b>ERPS:</b><br/>ERPS: Single ERPS Ring, Tangent ERPS Rings, Intersecting ERPS Rings, Compatible with RRRP<br/>G.8031: G.8031 (Ethernet Linear Network Protection)<br/>G.8032: G.8032 V1 &amp; V2, Single Ring, Sub Ring</li> <li>• <b>Loopback Detect:</b><br/>Support Loopback-detection</li> </ul> |

\* Specification will be changed without prior notice

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| Model   | AirLive L3D-2TX4806-40GF  |
|---|---|
| <ul style="list-style-type: none"> <li>• <b>Layer2 Multicast:</b><br/>IGMP Snooping: IGMPv1/v2/v3 Snooping, Fast leave, Static IGMP snooping group<br/>MVR: MVR (Multicast VLAN Registration)</li> <li>• <b>ARP:</b><br/>ARP: Static and dynamic ARP entries, Aging of ARP entries, Gratuitous ARP<br/>ARP Proxy: Basic ARP-Proxy, Local ARP-Proxy</li> <li>• <b>IPv4 Unicast Routing:</b><br/>IPv4 Static Routes: IPv4 Static Routes, Blackhole Routes, co-work with IP SLA, VRF (Virtual Routing and Forwarding), uRPF check<br/>RIP: RIPv1/v2<br/>Route policy: Route-map, IPv4 prefix-list<br/>PBR: PBR (Policy-based Routing)<br/>ICMP: ICMP redirect, ICMP unreachable<br/>ECMP: ECMP(SLB), ECMP(DLB), ECMP(RR), ECMP Self-healing</li> <li>• <b>IPv4 Multicast Routing:</b><br/>IGMP: IGMPv1/v2/v3, IGMP-Proxy, IGMP SSM Mapping</li> <li>• <b>VRRP:</b><br/>Support VRRP, Track for VRRP</li> <li>• <b>Smart Link:</b><br/>Support Multi-Instance<br/>Support Load Balance<br/>Support Multi-Link<br/>Support Monitor Link</li> <li>• <b>MLAG:</b><br/>Support MLAG Basic<br/>Support MLAG orphan port</li> <li>• <b>QoS:</b><br/>Traffic classification: Traffic classification based on COS/DSCP (simple classification), Traffic classification based on ACL (complex classification), Traffic classification based on inner header of the tunnel packets<br/>Traffic behaviors: Remark the priority fields(COS/DSCP) of the packet based on ACL, Remark the priority fields(COS/DSCP) of the packet based on Table Map, Flow redirection, Flow mirror<br/>Traffic policing: Traffic policing based on direction(in/out) of Port, Traffic policing based on direction(in/out) of VLAN, Traffic policing based on direction(in/out) of flow, Traffic policing based on direction(in/out) of aggregated flow<br/>Traffic shaping: Queue based traffic shaping, Port based traffic shaping<br/>Congestion management: SP (Strict Priority) scheduling, WDRR (Weighted Deficit Round Robin) scheduling, SP + WDRR mixed scheduling<br/>Congestion avoidance: TD (Tail Drop), WRED (Weighted Random Early Detection)</li> </ul> | <p>Traffic statistics: Packet counts and bytes statistics based on traffic classification, Packet counts and bytes statistics based on the color after traffic policing, Forwarded and discarded packet counts and bytes statistics</p> <p>ECN (Explicit congestion notification): ECN tags based on Tail Drop, ECN tags based on WRED</p> <ul style="list-style-type: none"> <li>• <b>VARP:</b><br/>Virtual Gateway: VARP (Virtual-ARP), VARP Subnet</li> <li>• <b>Tunnel:</b><br/>VxLAN: Manual configure VxLAN tunnel, VxLAN distributed gateway, VxLAN active-active access, Interconnect across Datacenters based on VxLAN, L2 Protocol packet passthrough, Edit DSCP in VxLAN outer header, Support to enable/disable overlay split horizon per-VNI<br/>Support GRE Tunnel<br/>Support NVGRE Tunnel<br/>Support GENEVE Tunnel</li> <li>• <b>DCB:</b><br/>DCBX: LLDP support DCBX TLV<br/>Support PFC</li> </ul> <p><b>Management and Maintenance</b></p> <ul style="list-style-type: none"> <li>• <b>System Security:</b><br/>SSH: SSHv1/v2, RSA Key generation<br/>Support RADIUS<br/>Support TACAS+<br/>AAA: Authentication, Authorization, Accounting<br/>Dot1x: Port based dot1x, MAC based dot1x, Guest VLAN<br/>ACL: MAC/IP ACL, Basic Mode ACL, Port-group ACL, VLAN-group ACL, IPv6 ACL<br/>Support ARP Inspection<br/>Support IP Source Guard<br/>Port Security: Limitation on MAC address learning on interface<br/>VLAN Security: Limitation on MAC address learning on VLAN<br/>Control Plane Policy (COPP): Black list/White list, Rate limit<br/>Support CPU Traffic Limit<br/>Prevent DDOS attack: Prevent DDOS attack (ICMP Flood/Smurf/Fraggle/LAND/SYN Flood)<br/>Login filter: Telnet/SSH ACL filtering, Telnet/SSH IPv6 ACL filtering<br/>MAC Security: MacSec (802.1AE)<br/>Support Link-Flapping detection</li> </ul> |

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| Model   | AirLive L3D-2TX4806-40GF  |
|---|---|
| <ul style="list-style-type: none"><li>• <b>Network Management:</b><br/>DHCP: DHCP Server, DHCP Relay, DHCP Snooping, DHCP Client, DHCP Option82, DHCP Option252<br/>Support RMON<br/>sFlow: sFlow v4/v5<br/>Support IP SLA<br/>Latency/Buffer Monitor: Latency Monitor, Buffer Monitor<br/>EFD: Elephant Flow Detection<br/>NTP: NTP (Network Time Protocol)<br/>Errdisable: Errdisable detection and recovery<br/>DNS: Static DNS Client<br/>Support LLDP</li><li>• <b>Terminal Services:</b><br/>Command Line Interface: Configurations through CLI (Command Line Interface)<br/>Help information: Banner configuration, Help information in English<br/>Terminal service: Vty Terminal service, Console Terminal service</li><li>• <b>Configuration Management:</b><br/>Management interface: Inband management interface and configuration, Outband management interface and configuration<br/>User privilege management: Privileged user priority and privileged commands<br/>SNMP: Network management based on SNMPv1/v2c/v3, Public and private MIB, Public and private Trap<br/>WEB: Configuration and management based on WEB UI<br/>RPC-API: Configuration and management based on RPC-API<br/>SmartConfig: SmartConfig (Automatically configuration when system start)<br/>OVSDB: Configuration and management based on OVSDB<br/>System profile configuration: Change the system specifications by choose different STM Profiles<br/>License control: Feature configuration based on License<br/>Restore factory default configuration: Restore factory default configuration</li></ul> | <p><b>Environment</b></p> <ul style="list-style-type: none"><li>• <b>Operating Temperature:</b> 0°C to +40°C</li><li>• <b>Storage Temperature:</b> -40°C to +70°C</li><li>• <b>Working Humidity:</b> 10%~90%, non-condensing</li><li>• <b>Storage Humidity:</b> 5%~95%, non-condensing</li></ul> <p><b>Standard package of switch</b></p> <ul style="list-style-type: none"><li>• <b>Product size:</b> 44.2 x 29.0 x 4.4 cm(L*W*H)</li><li>• <b>Package Dimensions:</b> 57.0 x 50.0 x 15.0 cm(L*W*H)</li><li>• <b>Package Weight:</b> N.W: 7.2KG/ G.W: 10.3KG</li><li>• <b>Package content:</b> Switch x 1, QIG x 1, Power cord x 1, Rack ear x 1</li></ul> <p><b>Standard carton package</b></p> <p>Carton Dimensions: 57.0 x 50.0 x 15.0cm (L*W*H)<br/>Packing QTY: 1 PCS<br/>Packing weight: 10.3 KG</p> <p><b>Ordering Information</b></p> <ul style="list-style-type: none"><li>• <b>Model:</b><br/>L3D-2TX4806-40GF</li><li>• <b>Name:</b><br/>L3 Managed Multi Giga switch, 54-Port including 4x 25/10G SFP28, 2x 40G QSFP+ Fiber ports.</li></ul> |

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