

# Network SWITCH



## LAYER 3 Gigabit with 4OSFP+ Network Switch

### AS5 Series

### AS5-S24QS4

## OVERVIEW

Angustos AS5 Series is Layer 3 with Full 10G+ TOR network switch series for high-performance computing, data center and campuses. supports up to 2.56Tbps switching capacity with 48 10GE ports + 2 40GE ports + 4 100G ports

Support high-performance L2/L3/L4 wire speed switching capacity by integrating services such as IPv6, MPLS, VPN, network security, flow analysis, virtualization, with high reliable techniques including continuous forwarding, graceful restarting and loop network protection



## PRODUCT FEATURES

### Carrier-level High Reliability

- Redundant Power module
- Dual backup, hot-swap
- Seamless switching, BDD mechanism
- STP / RSTP/MSTP
- VRRP - Ring protection

### Telecom-Level Ethernet Switch

- Telecom-level Ethernet-ring protection protocol
- STP/RSTP/MSTP
- Active and standby uplinks and LACP link aggregation
- Layer 2 + Layer 3 MPLS VPN

### Advance IPv6

- ICMPv6, DHCPv6, ACLv6 and IPv6 Telnet
- IPv6 neighbor discovery, Path MTU discovery
- Manual tunnel, ISAPTAP Tunnel, 6 to 4 tunnel
- IPv6 RADVD, MLDv1/v2, MLD Snooping, IPv6 static routing, RIPng, OSPFv3 and BGP4+

### Certification

- CE / FCC/ RoHS

## Flexible Networking

- Easy Maintenance with CLI/ Telnet/ SSH/ SSL and SNMP.
- Web GUI module built-in for easy management procedures.
- Support FTP, TFTP, SFTP, ISSU, Zero Touch Provisioning.
- Automatic equipment discovery, network topology, equipment configuration, performance data statistic and analysis.

## VLAN

- 4K Active VLAN,
- QinQ & Selective QinQ,
- GVRP, Private VLAN,

## Spanning Tree

- 802.1D (STP),
- 802.1W(RSTP) and 802.1S(MSTP)
- BPDU guard, root guard and loopback guard

## Multicast

- IGMP v1/2/3
- IGMP Snooping / IGMP Fast Leave
- IGMP Filter / MVR

## IP

- Static route
- RIP v1/v2, ECMP,
- OSPF, BGP, PBR, ECMP
- BFD for OSPF, BGP

## Basic Standards

- IEEE 802.3 - 10Mbit/s
- IEEE 802.3ab - G.bit/s Base-T
- IEEE 802.3z - G.bit/s Base-X
- IEEE 802.3u - 10/100 Mbit/s auto
- IEEE 802.3x/ 802.3ad / 802.3ae
- IEEE 802.1d/ 802.1p/ 802.1q/ 802.1w
- IEEE 802.1ab / 802.1ad/ 802.1ax

## QoS

- CAR, HQoS, MAC/IP/TCP/UDP/ VLAN/COS/DSCP/TOS based
- QoS, 802.IP/DSCP priority relabeling, SP, WRR, and "SP+WRR",
- Tail-Drop, WRED, flow monitoring and traffic shaping

## Security

- Port isolation, Port security, and "IP+MAC+port" binding, MAC sticky DHCP Snooping and option 82, DAI & IP source guard, PPPoE+,
- IEEE 802.1x, Radius and BDTacacs+
- L2/L3/L4 ACL flow identification and filtration Anti-attack from DDoS, TCP's SYN Flood, UDP Flood, etc.
- Broadcast/multicast/unknown unicast storm-control
- MD5, SHA-256, RSA-1024, AES256, etc.

## Environment

- Operating temperature/humidity: -10°C-60°C, 0%-90% non-condensing
- Storage temperature/humidity : -20°C-70°C, 0%-90% non-condensing

## Stability

- Static/LACP link aggregation, Interface backup
- EAPS and ERPS
- ISSU
- BVSS, VRRP, UDLD

## Management

- Console, Telnet, SSH v1/2, HTTP, HTTPS SNMP v1/v2/v3, RMON
- TFTP, FTP, SFTP
- NTP, Syslog, LLDP
- ZTP(Zero Touch Provisioning)
- SPAN, RSPAN

## DHCP

- DHCP server / relay / client
- DHCP snooping / option 82
- DHCP pool

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#### SPECIFICATION

#### AS5-S24QS4

Interface		24 10GE/GE SFP+ ports, 4 100GE/40GE QSFP28ports
Console		1 RJ45 console, 1 MGMT
Backplane		800 Gbps
Forwarding Rate (Mpps)		600 Mpps
Power consumption	No load	45 W
	Full load	70 W
Power supply	AC: 100V -240V	2 module
(hot-swap)	50Hz±10%	
Total Output BTU	(1000BTU/H=293W)	238.91
Fan		4
MTBF(H)		>200,000
Dimension	WxDxH (mm)	440x350x44
Weight	Empty (kg)	7.1
Forwarding Mode		Store-Forwarding
Flash (MB)		64
DRAM (MB)		1024
MAC		32K
Jumbo Frame		16K
Routing Table	IPv4	16K
	IPv6	12K
ARP Table	IPv4	10K
	IPv6	10K
Total SVI		1K
Certification	CE, FCC, RoHS	
Temperature	Operational : -10°C-60°C   Storage : -20°C-70°C	
Humidity	Operational : 0 - 90%   Storage : 0 - 90% Non-Condensing	

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#### SPECIFICATION (cont)

VLAN	4K Active VLAN, QinQ & Selective QinQ, GVRP, Private VLAN
Spanning Tree	802.1D (STP)/ 802.1W (RSTP) / 802.1S (MSTP), BPDU guard, root guard loopback guard
Multicast	PIM-SM, PIM-DM, IGMP v1/v2/v3, IGMP Snooping, IGMP Fast Leave, MVR, IGMP filter
IPv4	Static routing, RIP v1/v2, OSPF, BGP, PBR, ECMP, BFD for OSPF, BGP
IPv6	ICMPv6, DHCPv6, ACLv6 and IPv6 Telnet, IPv6 neighbor discovery, Path MTU discovery MLD V1/V2, MLD snooping, IPv6 Static Routing, RIPng, OSPFv3, BGP4+ Manual tunnel, ISATAP tunnel, 6 to 4 tunnel
MPLS	LDP protocol, Multi-VRF, MPLS L2 VPN
QoS	CAR, HQoS, MAC/IP/TCP/UDP/VLAN/COS/DSCP/TOS based QoS, 802.1P/DSCP priority SP, WRR, and "SP+WRR", Tail-Drop, WRED, flow monitoring and traffic shaping
Security	Port isolation, Port security, and "IP+MAC+port" binding, MAC sticky, DHCP Snooping and option 82 DAI & IP source guard, PPPoE+, IEEE 802.1x, Radius and BDTacacs+ L2/L3/L4 ACL flow identification & filtration , Anti-attack from DDoS, TCP's SYN Flood, UDP Flood, Broadcast/multicast/unknown unicast storm-control MD5, SHA-256, RSA-1024, AES256, etc.
Reliability	Static/LACP link aggregation, Interface backup BVSS virtual-stacking. EAPS and ERPS, URPF, LLDPISU,VRRP 1+1 power backup
Standard	<ul style="list-style-type: none"> <li>. IEEE 802.3</li> <li>. IEEE 802.3ab</li> <li>. IEEE 802.3z</li> <li>. IEEE 802.3u</li> <li>. IEEE 802.3x</li> <li>. IEEE 802.3ad</li> <li>. IEEE 802.3ae</li> <li>. IEEE 802.1d</li> <li>. IEEE 802.1p</li> <li>. IEEE 802.1q</li> <li>. IEEE 802.1w</li> <li>. IEEE 802.1ab</li> <li>. IEEE 802.1ad</li> <li>. IEEE 802.1ax</li> </ul>

#### Optional Power Module

AS3-PWM-150-DC	Hot-swap DC Power (Max Power 150W, DC-36V~72V input, isolated cooling fan)
AS3-PWM-150-AC	Hot-swap AC Power (Max Power 150W, AC 100-240V input, isolated cooling fan)

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<b>Optical Module</b>	<i>*Other module available upon request</i>
AS-SFP-CO	GE SFP single to RJ45 module
AS-SFP-SX-D	GE SFP MM (500m,850nm,LC,DDM)
AS-SFP-LX-10-D	GE SFP SM (10Km,1310nm,LC,DDM)
AS-SFP-LX-20-D	GE SFP SM (20Km,1310nm,LC,DDM)
AS-SFP-LX-40-D	GE SFP SM (40Km,1310nm,LC,DDM)
AS-SFP-ZX-80-D	GE SFP SM (80Km, 1550nm, LC, DDM)
AS-SFP-LX-310-10-BIDI	GE SFP SM, single-chip BIDI (10Km, TX1310/RX1550, LC, DDM)
AS-SFP-LX-310-20-BIDI	GE SFP SM, single-chip BIDI (20Km, TX1310/RX1550, LC, DDM)
AS-SFP-LX-550-10-BIDI	GE SFP SM, single-chip BIDI (10Km, TX1550/RX1310, LC, DDM)
AS-SFP-LX-550-20-BIDI	GE SFP SM, single-chip BIDI (20Km, TX1550/RX1310, LC, DDM)
<b>10G Optical Modules</b>	
AS-SFP+-SX	TE 10G SFP+ multi-mode (300m, 850nm, LC)
AS-SFP+-LX-10	TE 10G SFP+ single-mode (10Km, 1310nm, LC, DDM)
AS-SFP+-LX-20	TE 10G SFP+ single-mode (20Km, 1310nm, LC, DDM)
AS-SFP+-LX-40	TE 10G SFP+ single-mode (40Km, 1310nm, LC, DDM)
AS-SFP+-LX-SM-270-10	10GE SFP+SM, single-chip and BIDI (10Km, TX1270/RX1330, LC, DDM)
AS-SFP+-LX-SM-330-10	10GE SFP+SM, single-chip and BIDI (10Km, TX1330/RX1270, LC, DDM)
AS-SFP+-LX-SM-270-20	10GE SFP+SM, single-chip and BIDI (20Km, TX1270/RX1330, LC, DDM)
AS-SFP+-LX-SM-330-20	10GE SFP+SM, single-chip and BIDI (20Km, TX1330/RX1270, LC, DDM)
AS-SFP+-LX-SM-270-40	10GE SFP+SM, single-chip and BIDI (40Km, TX1270/RX1330, LC, DDM)
AS-SFP+-LX-SM-330-40	10GE SFP+SM, single-chip and BIDI (40Km, TX1330/RX1270, LC, DDM)
<b>40G Optical Modules</b>	
QSFP+SR4-100m	40G QSFP+ optical module (100m, 850nm, MPO, DDM, supports 1 to 4)
QSFP+LR4-10	40G QSFP+ optical module (10Km, 1310nm, LC, DDM)
QSFP+LR4-20	40G QSFP+ optical module (20Km, 1310nm, LC, DDM)
QSFP+ER4-40	40G QSFP+ optical module (40Km, 1310nm, LC, DDM)
QSFP28-SR4-100m	100G QSFP28 optical module (100m, 850nm, MPO, DDM)
QSFP28-LR4-10	100G QSFP28 optical module (10Km, 1310nm, LC, DDM)