



Gigabit Ethernet "Layer 2 Plus" Managed Switch

6 SFP FE/GbE + 2 SFP-TP Combo 10/100/1000 Ports

AS2-0806-GE Product Specification Data Sheet



Key Features

- ✓ 8-Port FE/GbE SFP fiber optic switch
- ✓ 9 KB jumbo frame support
- ✓ IEEE 802.1x Access Control improves network security
- ✓ Port Mirroring helps supervisor monitor network
- ✓ Q-in-Q (Double-Tag) VLAN for performance & security (provision, upgrade via FW)
- ✓ 4094 VLAN entries supported
- ✓ IEEE 802.1d Compatible, 802.1w RapidSpanning Tree and 802.1s Multiple Spanning Tree
- ✓ Unknown Unicast/Broadcast/Multicast Storm Control
- ✓ Multicast VLAN management for IPTV
- ✓ IP-MAC-Port binding for LAN security
- ✓ QCL based on application traffic for QoS and rate limitation management
- ✓ ACL based on Ethernet Type / ARP / IPv4 for packets permit or deny, rate limitation and port copy
- ✓ DHCP Snooping (Including DHCP Option 82)
- ✓ SSL/ SSH for management (prevision, upgrade via FW)
- ✓ TACACS+ for management authentication (prevision, upgrade via FW)
- ✓ Auto detect client idle or cable length for power saving

Overview

AS2-0806-GE, an 8-port Gigabit L2 Plus Managed Switch, is a standard switch that meets all IEEE 802.3/u/x/z Gigabit, Fast Ethernet specifications. The switch includes 6-Port 100/1000 Mbps SFP and 2-Port Combo Gigabit TP/SFP fiber optic dual media management interfaces. The switch can be managed through the RS-232 serial port, or through the Ethernet port using CLI or Web-based management units, associated with SNMP agent. With the SNMP agent, the network administrator can log onto the switch to monitor, configure and control each port's activity in a user-friendly way. Overall network management is enhanced and the network efficiency is also improved to accommodate high bandwidth applications. In addition, the switch features comprehensive and useful functions such as QoS (Quality of Service), Spanning Tree, VLAN, Port Trunking, Bandwidth Control, Port Security, SNMP/RMON and IGMP Snooping capability via the intelligent software. It is suitable for both metro-LAN and office applications. The switch includes increased support for Power saving to reduce the power consumption with Power Management.

Benefits

QoS with four priority queues

The QoS(Quality Of Service) Control List (QCL) feature provides four internal queues to support four different classifications of traffic. High priority packet streams experience less delay inside the switch, which supports lower latency for certain delay-sensitive traffic. The AS2-0806-GE can classify the packet as one of the four priorities according to vip port, 802.1p priority tag, DiffServ and/or IP TOS, IPv4 and UDP/TCP application traffic classes. The QoS operates at full wire speed. The actual scheduling at each egress port can be based upon a strict priority, weighted round robin or a mix of both.

Port Mirroring

Based upon ACL function to classify the ingress traffic to do port copy, this mechanism helps track network errors or abnormal packet transmission without interrupting the flow of data. Allows ingress traffic to be monitored by a single port that is defined as mirror capture port. The mirror capture port can be any 10/100 port or 10/100/1000 port. Mirroring multiple ports is possible but can create congestion at the mirror capture port.

Q-in-Q VLAN for performance and security (provision, upgrade via FW)

The VLAN feature in the switch offers the benefits of both security and performance. VLAN is used to isolate traffic among different users and thus provides better security. Limiting the broadcast traffic to within the same VLAN broadcast domain also enhances performance. Q-in-Q, the use of double VLAN tags is an efficient method for enabling Subscriber Aggregation. This is very useful in the MAN.

Isolated Group, provides protection for certain ports

The isolated group feature allows certain ports to be designated as protected. All other ports are non-isolated. Traffic between isolated group members is blocked. Traffic can only be sent from isolated group to non-isolated group.

Mac-based 802.3ad LACP with automatic link fail-over

Dynamic fail-over means packets will not get assigned to any trunk member port that has failed. If one of the ports were to fail, traffic will automatically get distributed to the remaining active ports.

SFC Transceiver Characteristics

| Optical Characteristics (-20°C to +70°C) | | | | | | | | | | | | | | | | | |
|---|------------------|------------------------|-----|------|-----------------------|-----|------|-----------------------|------|-----|------------------------|-----|------|-----------------------|-----|------|-------|
| Reach Category | | Medium Reach | | | | | | | | | Long Reach | | | | | | |
| Model Series: | | C-Series (FastE / GbE) | | | S-Series (Dual -Rate) | | | M-Series (Multi-Rate) | | | C-Series (FastE / GbE) | | | S-Series (Dual -Rate) | | | |
| Part Nomenclature: | | A04-1xxC-MD-W | | | A04-1xxS-MD-W | | | A04-1xxM-MD-W | | | A04-1xxC-LD-W | | | A04-1xxS-LD-W | | | |
| Transmitter | | | | | | | | | | | | | | | | | |
| Parameter | Sym | Min | Typ | Max | Min | Typ | Max | Min | Typ | Max | Min | Typ | Max | Min | Typ | Max | Units |
| Average Optical Output Power – FastE / GbE | P _O | -2 | 0 | 1 | -2 | 0 | 1 | -1 | 0 | 1 | -1 | 0 | 1 | -1 | 0 | 1 | dBm |
| Output Eye Conformance | | IEEE 802.3-2008 | | | IEEE 802.3-2008 | | | IEEE 802.3-2008 | | | IEEE 802.3-2008 | | | IEEE 802.3-2008 | | | |
| Receiver (Ethernet Sensitivity/Overload referenced to BER < 10E-12 with 2^7-1 PRBS; SONET/SDH Sensitivity/Overload referenced to BER < 10E-10 with 2^23-1 PRBS.) | | | | | | | | | | | | | | | | | |
| Parameter | Sym | Min | Typ | Max | Min | Typ | Max | Min | Typ | Max | Min | Typ | Max | Min | Typ | Max | Units |
| Average Optical Input Power – FastE / GbE | P _{Min} | - | -23 | -22 | - | -26 | -25 | - | -26 | -25 | - | -27 | -26 | - | -29 | -28 | dBm |
| Loss Of Signal De-Asserted – FastE / GbE | P _D | - | -23 | - | - | -26 | - | - | -26 | - | - | -27 | - | - | -29 | - | dBm |
| Loss Of Signal Asserted – FastE / GbE | P _A | - | -25 | - | - | -28 | - | - | -28 | - | - | -29 | - | - | -31 | - | dBm |
| Output Eye Conformance | | IEEE 802.3-2008 | | | IEEE 802.3-2008 | | | IEEE 802.3-2008 | | | IEEE 802.3-2008 | | | IEEE 802.3-2008 | | | |
| Link | | | | | | | | | | | | | | | | | |
| Parameter at Specified Bit Rate (Mbps) | Sym | 125 | - | 1250 | - | - | 1250 | - | 1250 | - | 125 | - | 1250 | - | - | 1250 | Units |
| Minimum Data Sheet Optical Power Budget | | 20 | - | 20 | - | - | 23 | - | 24 | - | 25 | - | 25 | - | - | 27 | dB |
| Minimum Planning Optical Power Budget | | 18 | - | 18 | - | - | 21 | - | 22 | - | 23 | - | 23 | - | - | 25 | dB |
| Minimum Required Optical Return Loss | ORL | 24 | - | 24 | - | - | 27 | - | 27 | - | 28 | - | 28 | - | - | 30 | dB |

Benefits (Continued)

802.1x Access Control improves network security

802.1x features enable user authentication for each network access attempt. Port security features allow you to limit the number of MAC addresses per port in order to control the number of stations for each port. Static MAC addresses can be defined for each port to ensure only registered machines are allowed access. By enabling both of these features, you can establish an access mechanism based on user and machine identities, as well as control the number of access stations.

802.1d Compatible, 802.1w Rapid Spanning Tree and 802.1s Multiple Spanning Tree

For mission critical environments with multiple switches supporting STP, you can configure the switches with a redundant backup bridge path, so transmission and reception of packets can be guaranteed in event of any fail-over switch on the network. MSTP is according to IEEE 802.1Q 2005 Clause 13 Multiple Spanning Tree Protocol. MSTP allows frames assigned to different VLANs to follow separate paths, each based upon an independent Multiple Spanning Tree Instance (MSTI), within Multiple Spanning Tree (MST) Regions composed of LANs and or MST Bridges.

DHCP Snooping (Including DHCP Option 82)

This DHCP Snooping feature utilizes the Dynamic Host Configuration Protocol (DHCP) relay agent information (option 82) to include information about itself and the attached client when forwarding DHCP requests from a DHCP client to a DHCP server via Trust Port. The DHCP server can use this information to assign IP addresses gateway subnet mask DNS for each subscriber of a service-provider network. The DHCP Snooping uses Trust Port and Trust DHCP Server IP Address to filter the illegal DHCP server traffic.

IGMPv3 Snooping

By default, Layer 2 Ethernet switches treat IP multicast traffic in the same manner as broadcast traffic by forwarding frames received on one interface to all other interfaces. This may create excessive traffic on the network and degrade the performance of hosts attached to the switches. The IGMPv3 snooping can significantly reduce traffic from streaming media and other bandwidth-intensive IP multicast applications.

IGMP Proxy

The IGMP proxy and IGMPv3 Snooping are functionally similar, but the mechanisms differ as follows:

- IGMP Proxy can send v1/v2 IGMP queries together.
- IGMP Proxy supports General Query Mac Response Timeout for checking the "client alive status" and speeds up the convergence of multicast group member .
- IGMP Proxy provides Specific (last member) Query to check (can be multiple times) whether other members interest in the same multicast group exists when the port receives IGMP leave.
- IGMP Proxy checks (can be multiple times) the latest status of the group member by scheduled polling from General/Specific Query . It avoids instant port link-down that removes the members from the multicast group.

The IGMP Proxy provides better performance than IGMPv3 Snooping for IGMP join and leave message exchange in the switch.

Two (2) dual media ports for flexible optical fiber connections; one (1) RJ-45 serial console jack

Two (2) dual media ports are provided for flexible fiber optic connections. You can select to install optional transceiver modules in these slots for short, medium or long distance optical fiber backbone attachment. Use of the SFP will disable their corresponding built-in 10/100/1000Base-T connections. One (1) RJ-45 serial console jack is provided.

Broadcast/Multicast/Unknown-Unicast Storm Control

To limit broadcast/multicast/unknown-unicast flooding in the network, broadcast/multicast storm control is used to restrict excess traffic. Threshold values are available to control the rate limit for each port. Packets are discarded if the count exceeds the configured upper threshold.

IP-MAC-Port Binding

The IP network layer uses a four-byte address. The Ethernet link layer uses a six-byte MAC address. Binding these two address types together allows the transmission of data between the layers. The primary purpose of IP-MAC binding is to restrict the access to a switch to a number of authorized users. Only the authorized client can access the switch's port by checking the pair of IP-MAC Addresses and port number with the pre-configured database. If an unauthorized user tries to access an IP-MAC binding enabled port, the system will block the access by dropping its packet.

Access Control List (ACL)

The ACLs are divided into EtherTypes, IPv4, ARP protocol, MAC and VLAN parameters etc. Here we will just go over the standard and extended access lists for TCP/IP. As you create ACEs for ingress classification, you can assign a policy for each port, the policy number is 1-8, however, each policy can be applied to any port. This makes it very easy to determine the type of ACL policy with which you will be working.

SSL and SSH for secure Management (provision, upgrade via FW)

Secure Sockets Layer (SSL) supports the encryption for all HTTP traffic, allowing secure access to the browser-based management GUI in the switch and Secure Shell (SSH) which supports the encryption for all transmitted data for secure, remote command-line interface (CLI) access over IP networks.

TACACS+ for Management Authentication (provision, upgrade via FW)

The switch supports the TACACS+ authentication for secure switch CLI Logon. It provides more secure authentication for management.

Power Saving

The Power Saving feature uses power management techniques to detect client-idle and cable length automatically to reduce power consumption.

Technical Specifications

Industry Standards

Standards Conformance:

- IEEE 802.3 10Base-T (Ethernet Twisted-pair Copper)
- IEEE 802.3u 100Base-TX Ethernet (Twisted-pair Copper)
- IEEE 802.3ab 1000Base-TX Ethernet (Twisted-pair Copper)
- IEEE 802.3z 1000Base-X Ethernet
- IEEE 802.3x Flow Control Capability
- ANSI/IEEE 802.3 Auto-negotiation
- IEEE 802.1q VLAN
- IEEE 802.1p Class of Service

Performance

Switching:

Capacity

- 8 Gigabit Ethernet ports with non-blocking wire speed performance.
- 8 K MAC addresses
- 16 Gbps Switch Capacity
- Supports Jumbo frame support, up to 9K
- Unknown Unicast/Broadcast/Multicast Storm Suppression
- Port Mirroring

VLAN

- Port-base VLAN
- IEEE802.1q tag-base VLAN, up to 4 K active VLANs
- Q-in-Q is an efficient method for enabling Subscriber Aggregation.
- Multicast VLAN management

Protocols:

LACP

- Port trunking with 4 trunking group
- Up to 4 ports for each group.

GVRP/GARP

- 802.1q with GVRP/ GARP

- IEEE 802.1x Access Control
- IEEE 802.1d Spanning Tree
- IEEE 802.1w Rapid Spanning Tree
- IEEE 802.1s Multiple Spanning Tree
- IEEE 802.3ad Link Aggregation Control Protocol (LACP)

RoHS Conformance

Power Saving:

- Auto detect client-idle or cable length

VSM (Virtual Stacking Management):

- Up to 16 switches can be managed via Single IP limited to any specific Danpex models.
- Virtual stacking, no extra stacking hardware is required
- Distributed stacking, no physical central wiring closet is needed

QoS

- Supports QCL for Layer 4 TCP/UDP Port and ToS Classification
- Supports 802.1p QoS with four level priority queue
- Supports priority in a Q-in-Q tag

Bandwidth Control

- Supports bandwidth rating per port ingress and egress rate limit 500 Kbps to 1000 Mbps with 1 Kbps increments.

Multicasting

- Supports IGMPv3 snooping including active and passive mode
- Supports IGMP proxy including active and passive mode

STP/RSTP/MSTP

- 802.1d/1w/1s

Network Security

- 802.1x access control for port based and MAC based authentication
- Management Access Policy Control
- Access Control List

--- IP-MAC-Port binding

- DHCP snooping and DHCP option 82
- SSL/SSH for Management (provision, upgrade via FW)
- TACACS+ for Management Authentication (provision, upgrade via FW)

Technical Specifications (Continued)

| SNMP v1, v2c Network Management | RFC 1213 MIB (MIB-II) | RFC 1757 RMON MIB |
|--|---------------------------------|--|
| | → Interface MIB | → Statistics Group 1 |
| | → Address Translation MIB | → History Group 2 |
| | → IP MIB | → Alarm Group 3 |
| | → ICMP MIB | → Event Group 9 |
| | → TCP MIB | → RFC 1493 Bridge MIB |
| | → UDP MIB | → RFC 1643 Ethernet MIB |
| | → SNMP MIB | → Enterprise MIB |
| LED Description | LED | |
| | Global | Power (CPU) |
| | SFP Port 1 to 8 | Link Activity |
| | UTP Port 1 to 2 | Link Activity |
| | UTP Port 1 to 2 | 1-/100/1000 Mbps |
| Network Interface | Connector | Port |
| 1000 Mbps SFP Fiber Optic Dual Media Auto Detect | TP (RJ-45) / SFP | 1 to 2 |
| 1000 Mbps SFP Fiber Optic | SFP | 3 to 8 |
| Hardware (Assembled in the Republic of China.) | Characteristics | Value |
| | Power | Voltage: 100 to 240 Volts AC |
| | | Frequency: 50 to 60 Hertz |
| | | Power Supply: 17 Watts |
| | Ambient Temperature (Operating) | 0°C to +40°C |
| | Humidity | 5% to 90% |
| | Dimensions (H x W x D) | 44 x 280 x 166 mm (1.73 x 11.02 x 6.54 inches) |
| | Weight | 1.4 Kg (3.1 pounds) |
| | EMI | Conforms to FCC Part 15 Class A and CE Mark Approval |

ITU Channel / CWDM λ ZonuColor / PN Codes

| ITU Ch | λ (nm) | ZColor | xx |
|--------|--------|--------|----|
| 3 | 1311 | | 31 |
| 11 | 1471 | GRA | 47 |
| 12 | 1491 | BLU | 49 |
| 13 | 1511 | WHT | 51 |
| 14 | 1531 | RED | 53 |
| 15 | 1551 | BLK | 55 |
| 16 | 1571 | ORA | 57 |
| 17 | 1591 | YEL | 59 |
| 18 | 1611 | BRN | 61 |

Ordering Information / Recommended SFC Part Numbers / Descriptions

| Medium Reach | Long Reach | Plain Language Description |
|---------------|---------------|--|
| A04-1xxC-MD | | SFC GbE 1xx1 nm DFB 18 dB DDM SC/APC PT |
| A04-1xxS-MD | | SFC Dual-Rate 1xx1 nm DFB 21 dB DDM SC/APC PT |
| A04-1xxM-MD | | SFC Multi-Rate 1xx1 nm DFB 21 dB DDM SC/APC PT |
| A04-1xxC-MD-L | | SFC GbE 1xx1 nm DFB 18 dB DDM LC/APC Receptacle |
| A04-1xxS-MD-L | | SFC Dual-Rate 1xx1 nm DFB 21 dB DDM LC/APC Receptacle |
| A04-1xxM-MD-L | | SFC Multi-Rate 1xx1 nm DFB 21 dB DDM LC/APC Receptacle |
| | A04-1xxC-LD | SFC GbE 1xx1 nm DFB 23 dB DDM SC/APC PT |
| | A04-1xxS-LD | SFC Dual-Rate 1xx1 nm DFB 25 dB DDM SC/APC PT |
| | A04-1xxC-LD-L | SFC GbE 1xx1 nm DFB 23 dB DDM LC/APC Receptacle |
| | A04-1xxS-LD-L | SFC Dual-Rate 1xx1 nm DFB 25 dB DDM LC/APC Receptacle |

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