

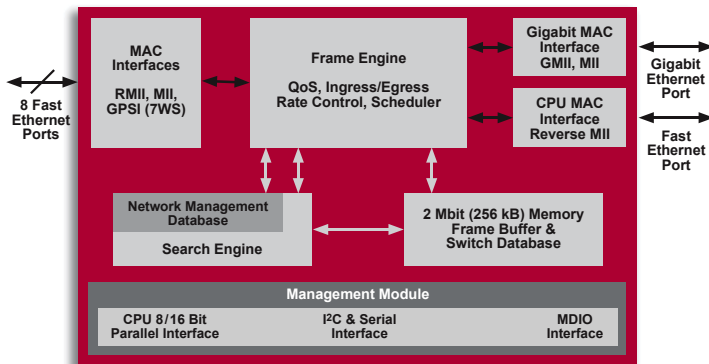
PRODUCT PREVIEW

The ZL50400/2/4/5/7/8/9 series of highly featured Fast Ethernet switches perform packet management, classification and Layer 2 forwarding in high-speed networking equipment.

The ZL50400/2/4/5/7/8/9 platform delivers the highest level of built-in programmable Quality of Service (QoS) features of any switching ICs in their class. These QoS features allow the series to manage the increasing amount of time-sensitive multimedia traffic that flows through today's networks due to the increasing deployment of Voice-over-IP and streaming voice and video. Featuring patent-pending failover protection, bi-directional rate control, and many advanced traffic management capabilities, the switches are ideal for meeting the increasing reliability and performance requirements of network access applications.

The series includes seven devices with fully managed and lightly managed options, each integrating up to 9 Fast Ethernet (10/100 Mbps) ports, 1 Gigabit Ethernet (10/100/1000) port and a 2 Megabit memory into a compact 17 mm x 17 mm package. The high-scale integration reduces board space and significantly reduces power consumption compared to alternative solutions.

ZL50408 Simplified Block Diagram



Applications

- ➔ Ethernet Backplanes
- ➔ IP PBX and VoIP line cards
- ➔ Multi-service access Gateways
- ➔ MDU/MTU and Enterprise equipment
- ➔ DSLAMs and DLC
- ➔ Basestations

Packaging and Availability

- ➔ 208-pin BGA (17 mm x 17 mm package)
- ➔ In volume production

Part	Description	Maximum Throughput	Full Wire Speed Forwarding Rate
ZL50400	9 FE Unmanaged/Lightly Managed	0.9 Gbps	2.68 Mpps
ZL50407	8 FE + 1 GIGE Unmanaged/Lightly Managed	1.8 Gbps	5.36 Mpps
ZL50408	8 FE + 1 GIGE Managed	1.9 Gbps	5.66 Mpps
ZL50409	9 FE Managed	1.0 Gbps	2.98 Mpps
ZL50404	5 FE Unmanaged/Lightly Managed	0.5 Gbps	1.49 Mpps
ZL50405	5 FE Managed	0.6 Gbps	1.79 Mpps
ZL50402	2 FE + 1 GIGE Managed	1.3 Gbps	3.87 Mpps

High Feature Integration

- ➔ 1.9 Gbps full-duplex, wire-speed forwarding for 8 FE + 1 GIGE variant
- ➔ Patent-pending failover improves system reliability with hardware-based real-time failure detection
- ➔ Precise input and output rate control at increments of 16 Kbps ideal for meeting service level agreements
- ➔ Full 4 K IEEE 802.1Q VLAN support Port and Tagged Based
- ➔ Integrated 2 Mbit (256 KB) memory for frame buffering, control and address search capacity
- ➔ Programmable traffic classification for Layer 2 through Layer 4 fields
- ➔ Congestion management using Weighted Random Early Detection/ Discard (WRED)
- ➔ Supports IEEE 802.1p/Q QoS with up to 4 transmission priority queues
- ➔ Two levels of packet dropping precedence on all ports
- ➔ Industrial temperature grade qualification

Flexible Interfaces

- ➔ Supports RMII, MII, and GPSI interfaces on all Fast Ethernet ports
- ➔ Bi-directional MII clock interface allows direct MAC-to-MAC connections to MII interfaces on DSPs, Network processors, and ASICs, thereby reducing bill of materials (BOM) for conversion logic and simplifying design
- ➔ Unmanaged and managed applications support I2C, serial, Reverse MII and 8/16-bit CPU interfaces
- ➔ Full-duplex IEEE 802.3x flow control with back-pressure flow control for half-duplex ports
- ➔ Cascading GIGE ports (ZL50407/8) and trunking across chips (IEEE 802.3ad Link aggregation) supports customer-defined scalability (up to 16 ports) and bandwidth requirements

Customer Support

Zarlink offers an evaluation kit and a complete suite of switch management software compatible with VxWorks and Nucleus operating systems.

ZL50400/2/4/5/7/8/9 ETHERNET SWITCHES

APPLICATION

Private VLAN/VoIP Gateway

Zarlink's ZL50400/2/4/5/7/8/9 switches are ideal for use in gateways, MDU/MTU aggregation units, and Ethernet linecards as shown below. In these applications, the ZL50400/2/4/5/7/8/9 series receives, prioritizes and forwards packets of voice, video and data traffic at wire speed, simultaneously over all ports.

In the gateway application, the switches are ideal for voice systems based on multiple DSPs. The bi-directional MII and GPSI interface allows reverse clocking through direct MAC-to-MAC connections. The ability to provide direct MII to MII connections with Network Processors and DSPs simplifies designs and reduces the need for costly external conversion logic which could reduce the system BOM costs significantly.

Additional advantages to voice systems are realized using the proven QoS architecture of this platform. When traffic enters a device, it is prioritized into eight classes of data and congestion is managed by the WRED.

Packets are sent through two transmission queues for each 10/100 port and four transmission queues for each Gigabit Ethernet port. The output scheduling algorithms Strict Priority and Weighted Fair

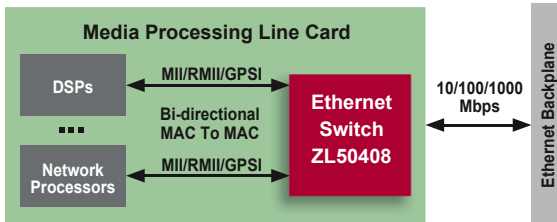
Queuing (WFQ) are then used to ensure that the time-sensitive voice and video traffic to move quickly through the system.

For service provider applications such as the MDU/MTU aggregation unit, each port offers programmable, precise input and output rate control down to 16 Kbps. The industry-leading level of granularity makes the device ideal for handling voice and data traffic while offering the flexibility of allocating bandwidth as needed.

The ZL50400/2/4/5/7/8/9 series also improves reliability at the system level using patent-pending failover protection. This hardware-based, real-time failure detection is a significant advantage compared to alternative systems, which can require several seconds to register errors. Providing real-time feedback to the CPU ensures reliability during system failure, thereby eliminating the need for costly redundant systems.

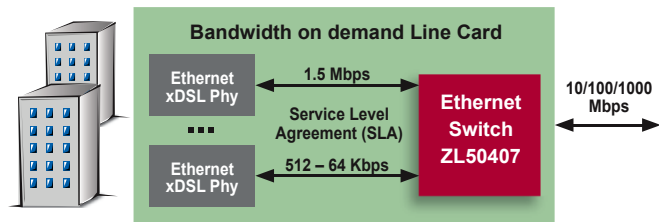
The combination of an industry-leading feature set in a cost-effective, small form factor design allows engineers to quickly and efficiently design network access systems.

VoIP Gateway Application Example



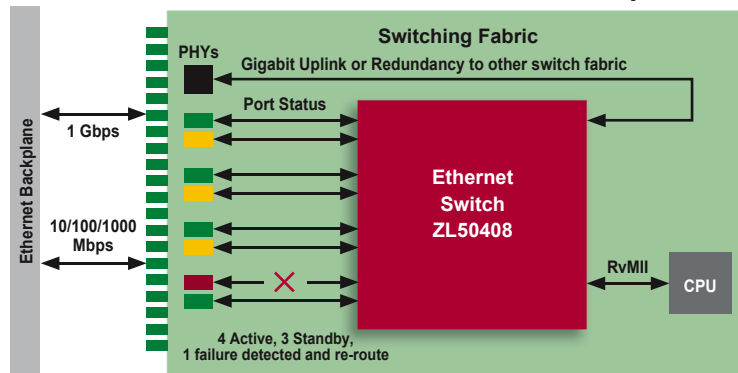
Direct MAC to MAC Connection with DSP and Network Processor eliminates conversion logic

MDU/MTU Aggregation Unit Example



16 Kbps Rate Control granularity Provides precise bi-directional traffic control

Hardware Failure Protection Example



Hardware Failure detection enables fast recovery