

3-Port 10/100 Switch with Transceivers and Frame Buffers

Micrel's KS8993 is the world's first integrated three-port 10/100 Fast Ethernet switch with enhanced QoS. This device integrates three 10BASET/100BASETX transceivers, three MAC (Media Access Control) units with high-speed layer 2 switch and 64k Byte embedded frame buffer.

The KS8993 runs in two modes. The first mode is a three-port integrated switch and the second is as a three-port switch with the third port decoupled from the physical port. In this mode access to the third MAC is provided using a reverse or forward MII (Media Independent Interface) such that an external MAC can be directly connected to the KS8993. This interface also supports the 7-wire (serial network interface) as used by some routing devices.

Useful configurations include a stand alone three-port switch as well as a two-port switch with a routing element connected to the extra MII port. The additional port is also useful for public network interfacing.

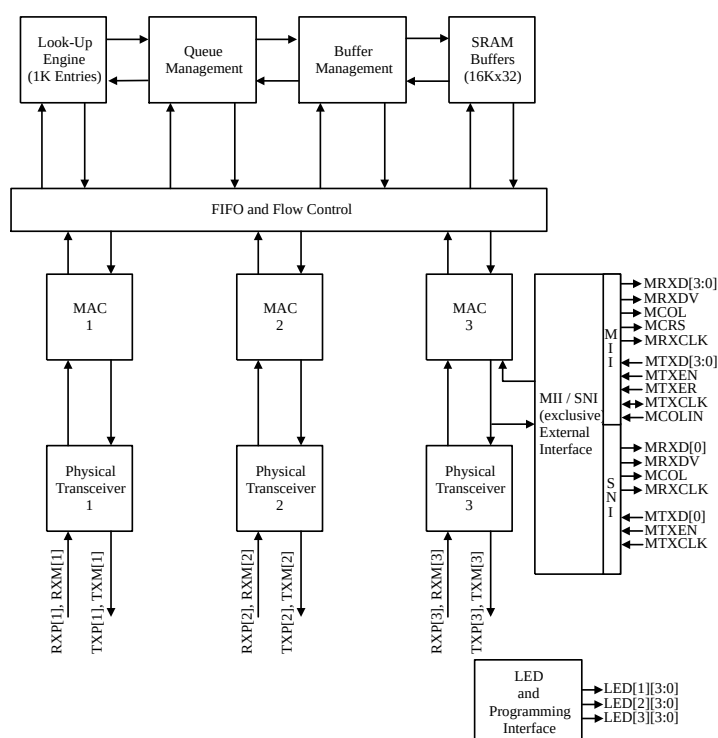
The KS8993 enables QoS using VLAN and 802.1p priority queuing and is designed to reside in an unmanaged design not requiring processor intervention. This is achieved through I/O strapping at system reset time.

On the media side, the KS8993 supports 10BaseT, 100BaseTX and 100BaseFX as specified by the IEEE 802.3 committee.

Micrel's Patented Mixed Signal Technology

Physical signal transmission and reception are enhanced through use of patented mixed signal circuitry that makes the design more efficient and allows for lower power consumption and smaller chip die size.

Block Diagram



Features

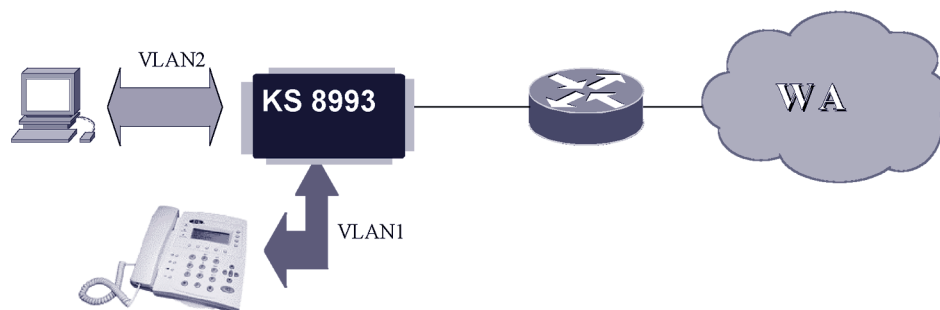
- World's first 3-port 10/100 integrated switch with physical layer transceivers
- 64kB SRAM on chip for frame buffering
- 1.0Gbps high performance memory bandwidth
- Low power dissipation: 300mA (0.75W) including physical transmit drivers
- Supports port-based VLAN
- Supports 802.1p-based priority or port-based priority.
- Support for UTP or fiber installations
- Indicators for link, activity, full/half-duplex and speed
- Unmanaged operation via strapping at system reset time
- Hardware-based 10/100, full/half, flow control and auto-negotiation
- Individual port-forced modes (full-duplex, 100BaseTX) when auto-negotiation is disabled
- On-chip integrated address look-up engine, supports 1K absolute MAC addresses

- Automatic address learning, address aging and address migration
- Full-duplex IEEE 802.3x flow control
- Half-duplex back pressure flow control
- Optional external MAC interface (MII or SMI) for router applications
- 10BaseT, 100BaseTX and 100BaseFX modes of operation
- Single 2.5V power supply
- Available in 128-pin PQFP package

System Level Applications

The KS8993 can be configured to fit either in a three port 10/100 application or as a two port 10/100 network interface with an extra MII port. This MII port can be connected to an external processor and used for routing purposes or public network access. The major benefits of using the KS8993 are the lower power consumption, unmanaged operation, flexible configuration and built in frame buffering.

Typical Enterprise IP phone application using KS8993 switch to connect one port to phone and other port to PC.



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