9 Port 10/100 Integrated Switch with PHY and Frame Buffers

Introduction

The KS8999 contains eight 10/100 physical layer transceivers, nine MAC (Media Access Control) units with an integrated layer 2 switch. The device runs in two modes. The first mode is an eight port integrated switch and the second is as a nine port switch with the ninth port available through an MII (Media Independent Interface).

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

The KS8999 is designed to reside in an unmanaged design not requiring processor intervention. This is achieved through I/O strapping or EEPROM programming at system reset time.

On the media side, the KS8999 supports 10BaseT, 100BaseTX and 100BaseFX as specified by the IEEE 802.3 committee.

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

Highlights

- 9 port 10/100 Integrated Switch with 8 Physical Layer Transceivers
- SRAM on chip for frame buffering
- 2.0Gbps high performance memory bandwidth
- 10BaseT, 100BaseTX and 100BaseFX modes of operation
- Superior analog technology for reduced power and die size
- Single 2.0 V power supply with options for 2.5 V and 3.3 V I/O
- 900 mA (1.80 W) including physical transmit drivers
- 208 pin PQFP package
- Supports port based VLAN
- Supports DiffServ priority, 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 or EEPROM 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
- Wire speed reception and transmission
- Integrated address Look-Up Engine, supports 1K absolute MAC addresses
- Automatic address learning, address aging and address migration
- Broadcast storm protection
- Full duplex IEEE 802.3x flow control
- Half duplex back pressure flow control
- Comprehensive LED support
- External MAC interface (MII or SNI) for router applications
- Supports MDI / MDI-X auto crossover
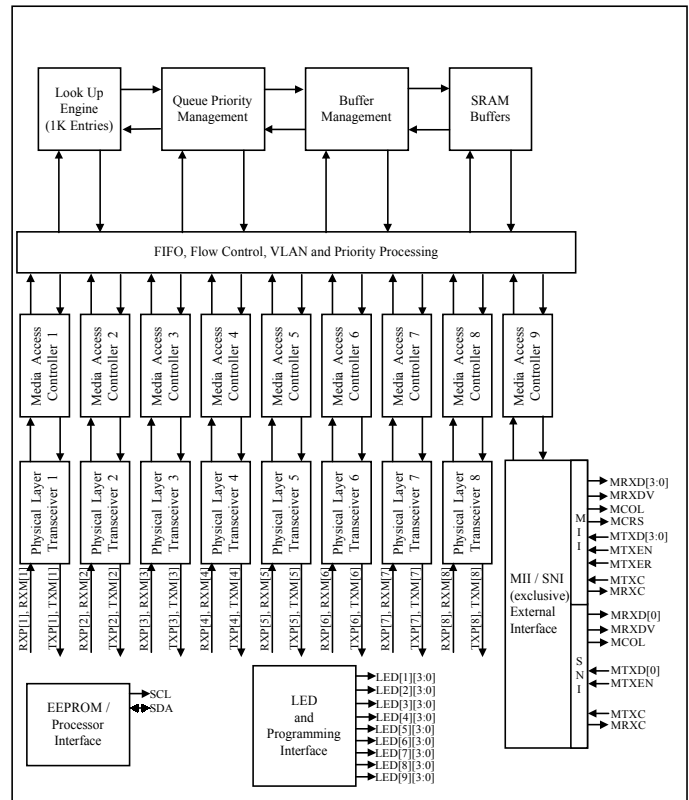
KS8999 Block Diagram

System Level Applications

The KS8999 can be configured to fit either in an eight port 10/100 application or as a nine port 10/100 network interface with an extra MII / SNI port. This MII / SNI port can be connected to an external processor and used for routing purposes or public network access. The major benefits of using the KS8999 are the lower power consumption, unmanaged operation, flexible configuration, built in frame buffering, VLAN abilities and traffic priority control. Two such applications are depicted below.

KS8999 Applications

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                                        ┌─────────────┐
                                        │   Public    │
                                        │   Network   │
                                        │   Access    │
                                        └─────────────┘
                                           ↑     ↓
                                        ┌─────────────┐
                                        │   Routing   │
                                        │   Engine    │
                                        └─────────────┘        MII or
                                           ↑     ↓              SNI
         ┌──────────┐                    ┌─────────────┐
         │  KS8999  │                    │   KS8999    │
         │  8 Port  │                    │   9 Port    │
         │  Switch  │                    │   Switch    │
         │   with   │                    │    with     │
         │   PHY    │                    │    PHY      │
         └──────────┘                    └─────────────┘
           ↑     ↓                          ↑     ↓
         ┌──────────┐                    ┌─────────────┐
         │    8X    │                    │     8X      │
         │Transformer│                   │ Transformer │
         │ or Fiber │                    │  or Fiber   │
         │Interface │                    │  Interface  │
         └──────────┘                    └─────────────┘
      ┌──────────────┐        Or      ┌──────────────────┐
      │8 Port Stand Alone│            │ 9 Port with Public│
      └──────────────┘                │ Network Interface │
                                      └──────────────────┘
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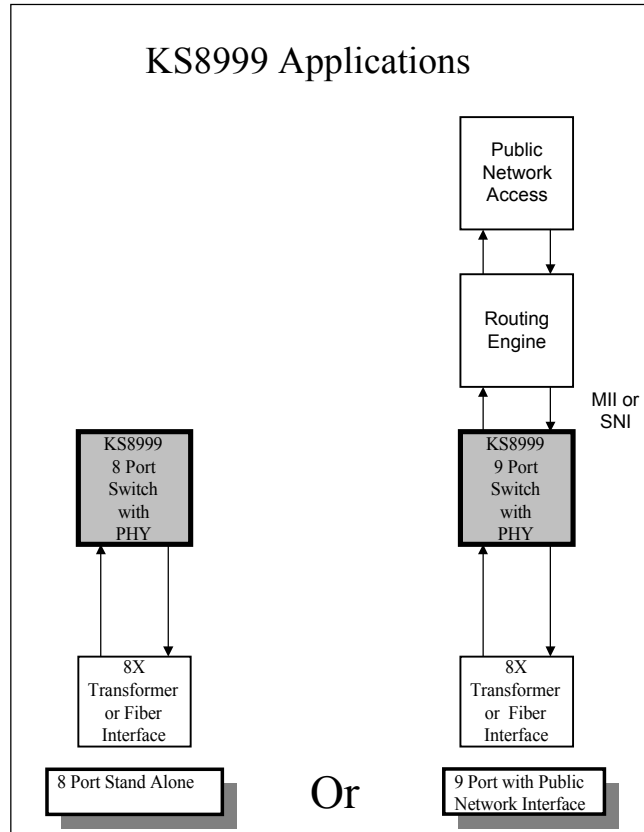
Major Applications:

- ❑ SOHO standalone switches
- ❑ SOHO routers and gateways
- ❑ Small workgroup switches
- ❑ VoIP infrastructure switches
- ❑ 10/100 Base-TX to 100 Base-FX Media converter