FUJITSU

MB8AA3020
The Fujitsu 20-port 10Gbps Ethernet Switch Chip

20+2 Port Ethernet Switch
- 20 x 10GBE Ports
- 2 x 10/100/GBE Ports
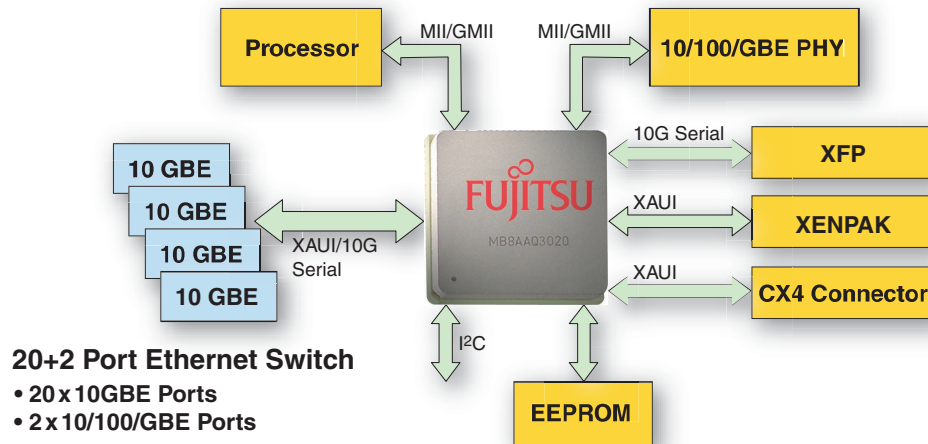
▶ Features

- Mature field proven architecture
- 20-port 10Gbps switching operations at wire speed
- 2 Gigabit Ethernet (GbE) management ports
- On chip micro-engine for management
- EEPROM interface used for initialization
- 2 I²C interfaces
- 2 MDIO interfaces
- Integrated high-performance SerDes
  - Integrated XAUI/CX4 SerDes for all 20 high speed ports
  - 10Gbps serial capabilities for all 20 high speed ports
  - Adaptive equalization eliminates the need for external clock re-timer circuit in CX4 applications
- 400+ Gbps of non-blocking switching capacity
- Cut through switching mode for latency sensitive applications
- Supports 8-classes of service per port
- Strict or Deficit Round Robin used for priority scheduling
- Committed and Peak Information Metering used for traffic shaping
- Ultra low pin-to-pin switching latency
- Advanced class Ethernet features
  - Priority PAUSE
  - Backward Congestion Notification (BCN) Support
  - Early packet drop congestion avoidance capabilities based on Ingress and Egress buffer usage

- Layer 2 capabilities
  - Unicast and multicast forwarding, address learning and aging
  - 16K+ MAC address table
  - Supports up to 16K jumbo frames
  - STP/RSTP/MSTP capable
  - Link aggregation (802.3 clause 43)
  - 802.3ae full-duplex operation using PAUSE flow control
  - VLAN table with 4K of VLAN (802.1Q) address
  - User programmable VLANs
  - Extended VLAN capabilities for up to 64 logical partitions
  - Shared and Independent VLAN learning capabilities
  - Less MAC table consumption capabilities for IVL
- Layer 2+ features
  - IGMP and MLD snooping capabilities
  - DiffServ for IPv4 and IPv6
- Monitoring
  - Port and VLAN mirroring
  - RMON and SMON statistics counter
  - sFlow (RFC3176) support
- Port security filtering based on source MAC address
- Low power consumption
- Large 2.9MB integrated memory
- 90nm technology
- Small (35mm x 35mm) foot print

MB8AA3020

▶ Benefits

- High level of integration in a low-power, low-latency small-footprint package makes the Fujitsu 10GbE switch ideal for backplane switch fabric applications

- Integrated, programmable, high-speed SerDes allows each port to be either 10Gbps serial, XAUI or CX4 capable, giving system designers added flexibility

- 10Gbps serial capabilities enable the use of XFP modules without requiring third-party SerDes chips. This reduces board space, latency, cost and power consumption

- Backplane 10Gbps serial capabilities enable designers to use fewer physical backplane fabric connections

- Adaptive-equalization algorithm eliminates the need for an external re-timer circuit in CX4 cabling, saving board space, power, latency and cost

- Redundant Gigabit Ethernet ports gives users a high-availability, agonistic management interface that is not tied to any particular processor chip

- On-chip micro-engine increases flexibility and simplifies software development, reducing time to market

▶ Applications

- Embedded, next-generation, high-density backplane switching applications

- Blade-server switching applications

- Advanced TCA carrier-board backplane fabric applications

- microTCA MCH applications

- Low latency interconnects for cluster computing
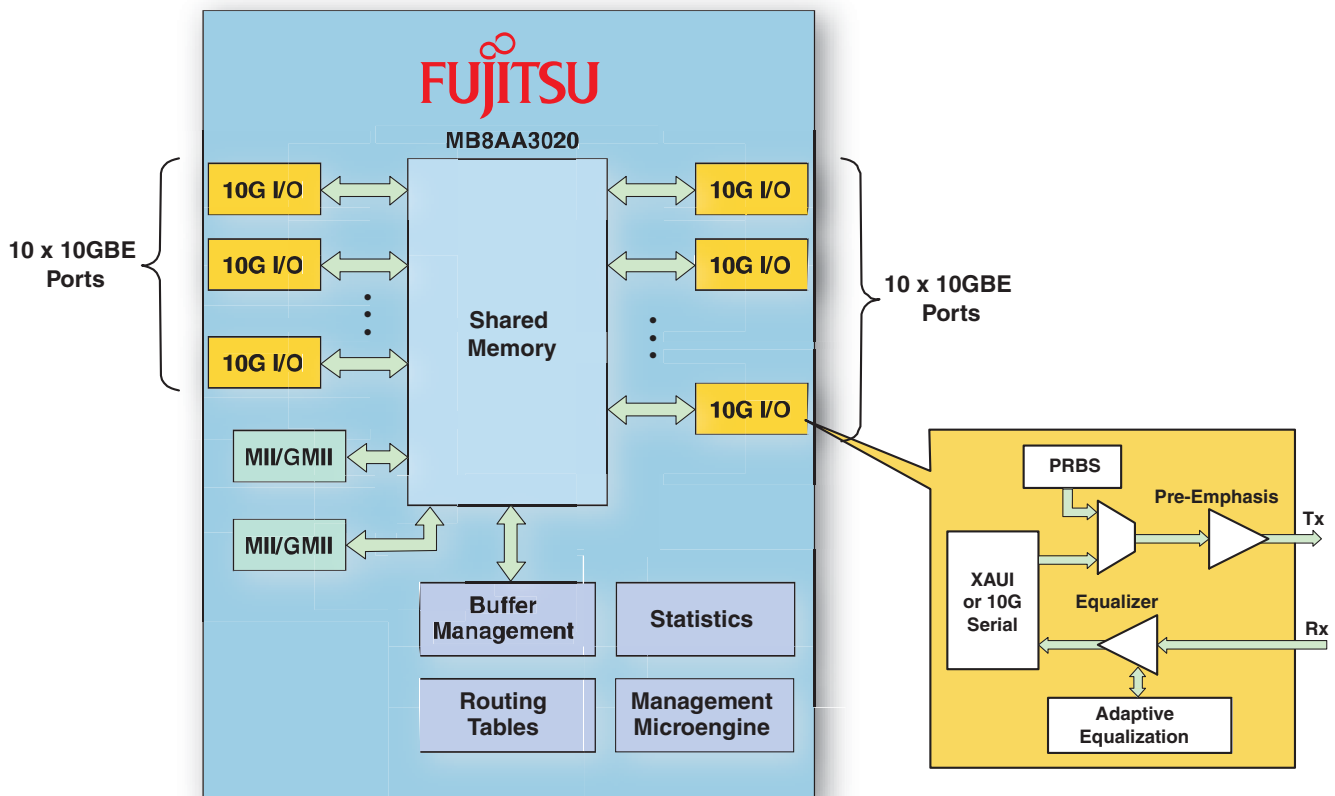
The Fujitsu 20-port 10Gbps Ethernet Switch Chip

▶ Description

Fujitsu's next-generation high-density switch chip embeds 20 high bandwidth, full-duplex 10 Gbps ports into a single, integrated, small-footprint package. Each port has the flexibility to support either 10Gbps serial, XAUI or CX4. In addition, the adaptive equalization capability on each port can increase reach for XAUI, CX4 and 10Gbps serial applications, as well as eliminate the need for external re-timer circuits, reducing board space, power consumption and cost.

With 10Gbps serial capabilities on each port, the MB8AA3020 allows direct connection to optical XFP modules on any port, eliminating the use of third party SerDes chips. This reduces board complexity, improves cost, and reduces time to market.

MB8AA3020 offers a total of 400Gbps of non-blocking aggregate switching capacity in both cut-through and store-and-forward mode of operation. A switching latency of 300ns, including 10GbE SerDes in cut-through mode, makes the switch ideally suited for high-density, latency-sensitive applications.

As a result of being fabricated with 90nm technology, the MB8AA3020 provides the lowest-power-consumption highest-density 10GbE switch chip in the industry, making the MB8AA3020 well suited for high density, low-power applications.

The Fujitsu MB8AA3020 20-port 10GbE switch chip provides eight priority classifications per port, which allows priority switching based on DiffServ, MAC address, VLANs, extended VLANs and ports. The MB8AA3020 also provides several carrier-grade Ethernet features including priority PAUSE, backward congestion notification, and early-class watermark capabilities for congestion notification. These features in combination with its large buffer memory, allow the MB8AA3020 to handle both best-effort and guaranteed-high-availability customer traffic in a single chip.

In addition to its standard 4K VLAN and Q-in-Q capabilities, the chip provides 64 additional user VLAN addresses, which can be used to logically partition a network without the use of Q-in-Q.
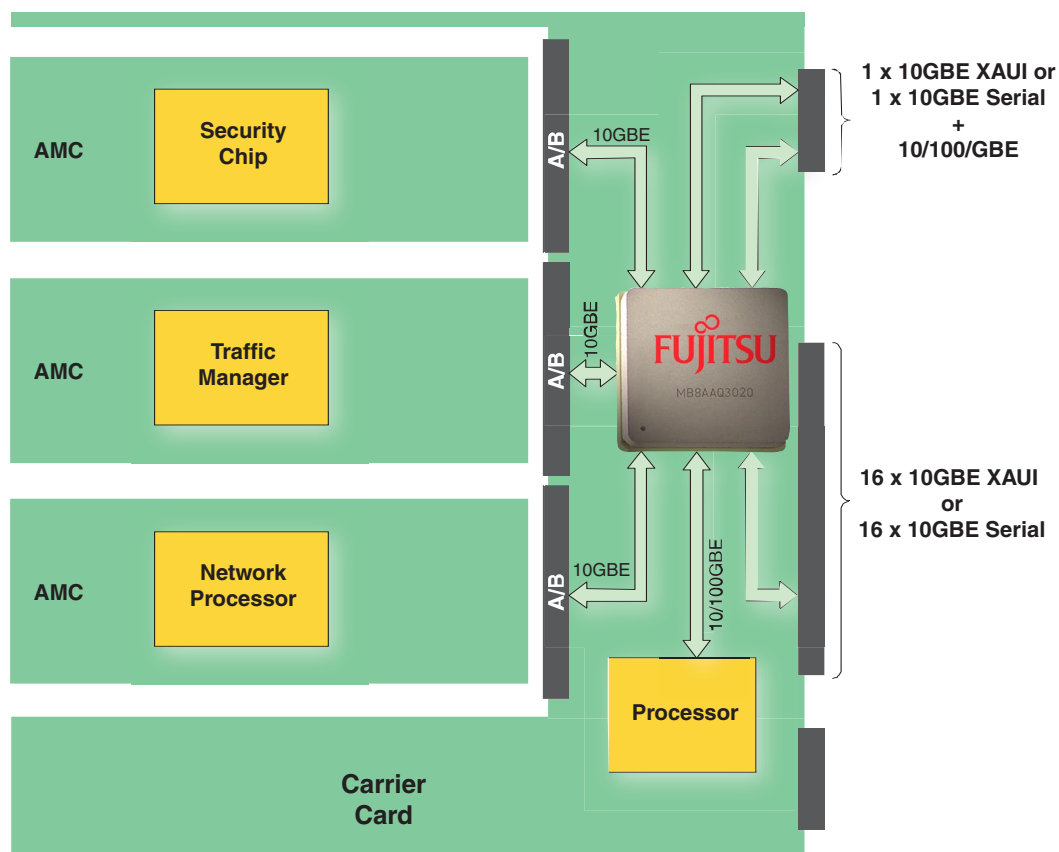
MB8AA3020

The MB8AA3020 possesses two 10/100/1000 Ethernet management interfaces, which provide an agnostic interface to the chip, allowing it to communicate with any third-party processor chip. The MB8AA3020 also supports I^2C interfaces, MDIO interfaces and EEPROM interfaces for low-speed communication with third-party external devices.

The Fujitsu MB8AA3020 10Gbps 20-port Ethernet switch provides an integrated on-chip micro-engine which executes commands sent by the Ethernet management interface. This simplifies software development, increases flexibility and reduces time to market.

The Fujitsu MB8AA3020 module is the industry's most advanced, high-density switching architecture, providing a low-latency, low-power, feature-rich switch in a small form-factor footprint. The MB8AA3020 is well-suited for next-generation backplane fabric applications seen in AdvancedTCA, µTCA and blade server platforms.

FUJITSU MICROELECTRONICS AMERICA, INC.