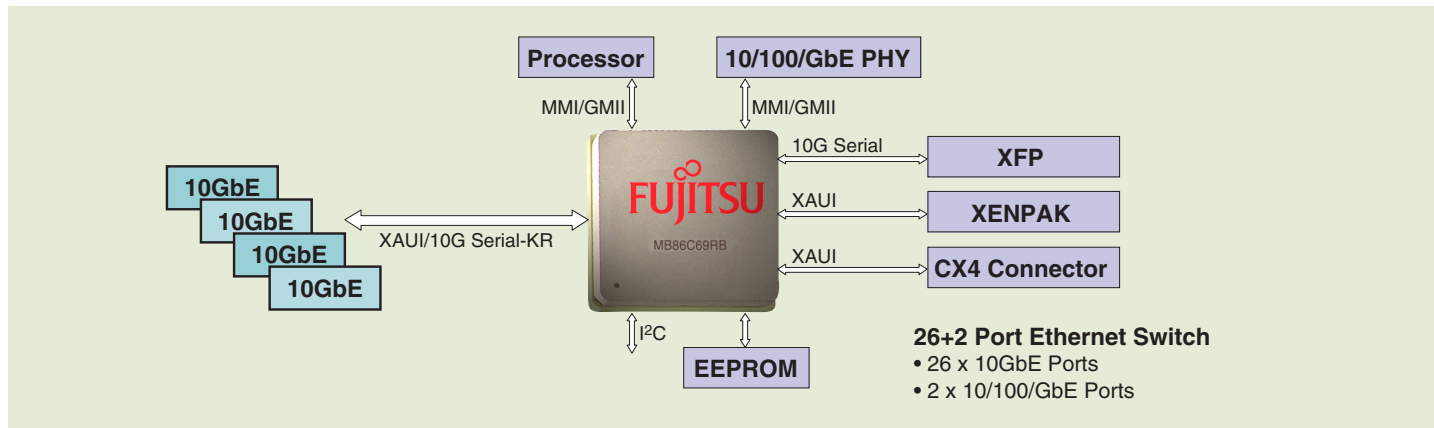


# MB86C69RBC

## The Fujitsu 26-port 10Gbps Ethernet Switch Chip



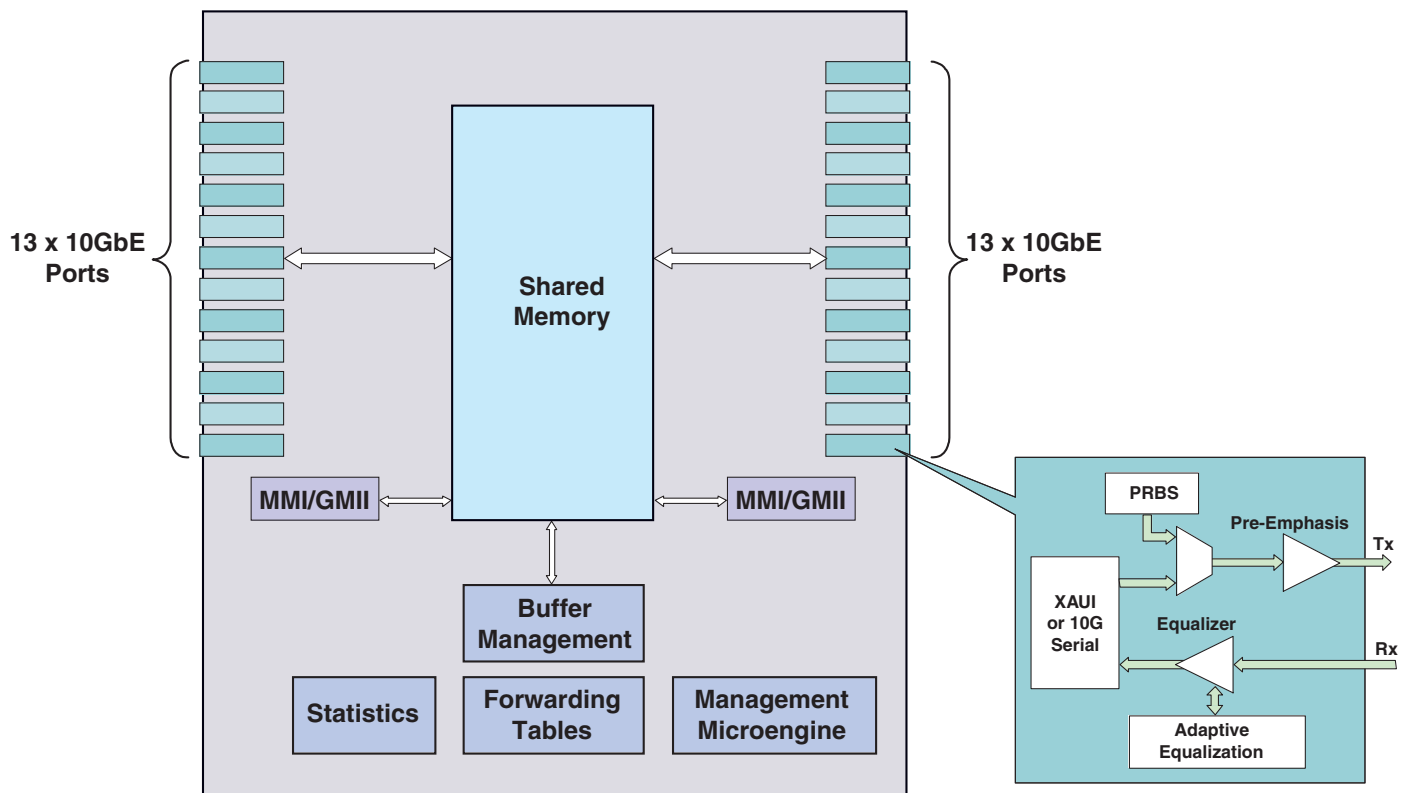
### ► Features

- Mature field-proven architecture
- Total of 28 Ethernet ports
  - 26 Ethernet ports that are configurable to operate at 10Gbps or 1Gbps wire speed
  - Two additional 1Gbps Ethernet management ports
- On-chip micro-engine for management
- EEPROM interface used for initialization
- 2 I<sup>2</sup>C interfaces
- 2 MDIO interfaces
- Integrated high-performance SerDes
  - Integrated KR/XAUI/CX4/SGMII SerDes for all 26 high-speed ports
  - KR capabilities for all 26 high-speed ports
  - Adaptive Rx equalization, which eliminates the need for expensive external clock re-timer circuitry
- 520+ Gbps of non-blocking switching capacity
- Cut-through switching mode for latency-sensitive applications
- Support for eight 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 Ethernet class features
  - Per priority PAUSE
  - Backward Congestion Notification 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
  - Support for up to 16K jumbo frames
  - STP/RSTP/MSTP capable
  - Link aggregation (802.3 clause 43)
  - 802.3ae full-duplex operation using PAUSE flow control
  - L2 ACL
  - VLAN translation
  - 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
- Layer 3 features
  - L3 forwarding with 16K IP address table
  - IGMP and MLD snooping capabilities
  - DiffServ for IPv4 and IPv6
  - L3 ACL
- Monitoring
  - Port and VLAN mirroring
  - RMON and SMON statistics counter
  - Flow (RFC3176) support
- 802.1x port security filtering based on source MAC address
- DoS-attack detection support
- Typical 22W power consumption under full load conditions
- Large 2.9MB integrated memory
- 90nm technology
- Smallest (35mm x 35mm) footprint in the industry

# MB86C69RBC

## Benefits

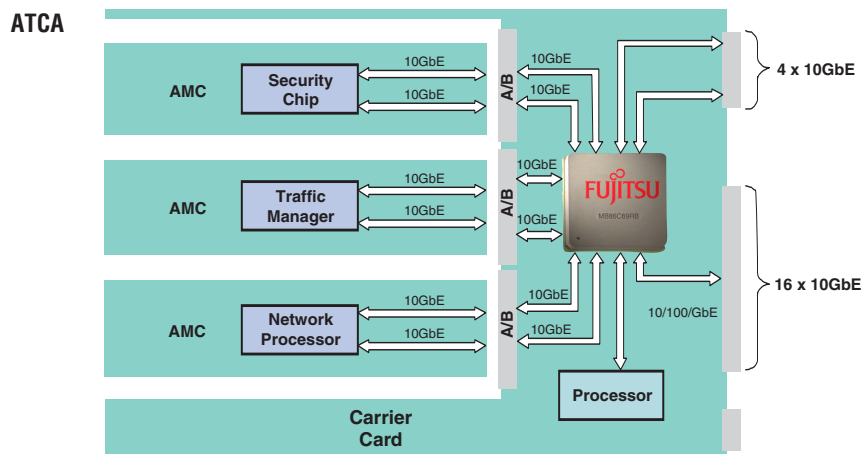
- The Fujitsu 26-port switch is the highest density, lowest power 10GbE switch available today, making it ideal for backplane fabrics or interconnect applications.
- Integrated programmable high-speed SerDes allows each port to be either KR, XAUI, CX-4 or 1000 Base KX or SGMII compatible, enhancing flexibility.
- 10Gbps serial capabilities enable direct connect to XFP modules or 10Gbps serial-KR backplanes, reducing board space, latency, cost and power consumption.
- Fully compliant 10Gbps serial KR capabilities enable designers to use fewer physical backplane fabric connections.
- An adaptive equalization algorithm eliminates the need for an external re-timer circuit in CX-4 cabling, saving board space, power, latency and cost.
- Redundant Gigabit Ethernet ports give users a high-availability agnostic management interface that is not tied to any particular processor.
- The on-chip micro-engine increases flexibility and simplifies software development, reducing time to market.
- Congestion management features, including Backward Congestion Notification (BCN) and per-priority-PAUSE (PPP), improve the performance and efficiency of the network, reducing the total cost of ownership.



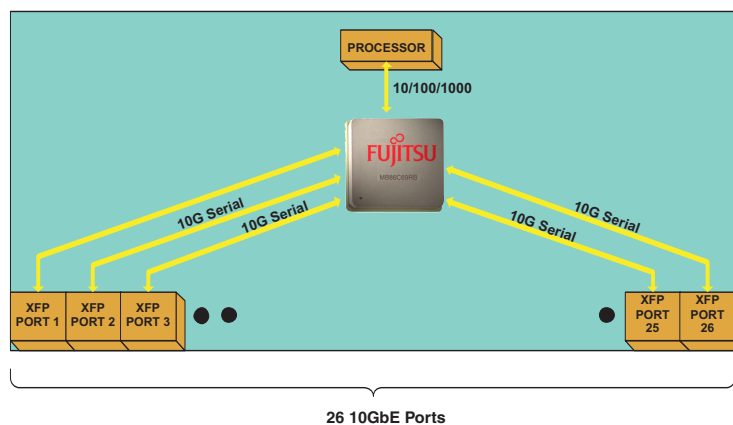
# The Fujitsu 26-port 10Gbps Ethernet Switch Chip

## ► Applications

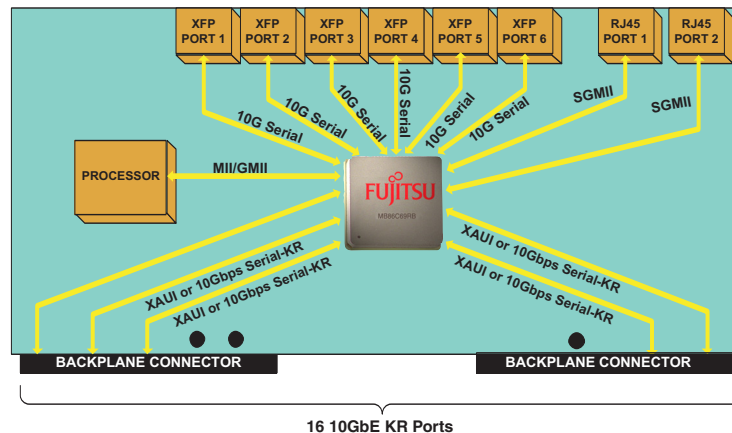
- Embedded next-generation, high-density backplane switching applications
- Blade-server switching applications
- AdvancedTCA carrier board backplane fabric applications
- $\mu$ TCA MCH applications
- Low-latency interconnects for high-performance cluster computing
- iSCSI storage



## Rack Mount Server Chassis



## Blade Server



# MB86C69RBC

## ► Description

Fujitsu's new Multi-rate 10GbE, high-density switch chip embeds 26 high-bandwidth, full-duplex 10Gbps ports into a single, integrated, small-footprint package. Each port has the flexibility to support KR, XAUI, CX-4 or SGMII. The use of adaptive equalization on each port can increase reach for XAUI, CX-4 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 Fujitsu MB86C69RBC can directly connect to optical XFP modules or 10Gbps serial-KR backplanes (802.3ap compliant) on any port, eliminating the use of third-party SerDes chips. This reduces board complexity, lowers costs, and cuts down development time.

The chip offers 520Gbps of non-blocking aggregate switching capacity in both cut-through and store-and-forward modes of operation. A switching latency of 300ns (including SerDes in cut-through mode) makes the switch ideally suited for high-density, latency-sensitive applications.

Because it was fabricated in 90nm technology, the chip provides a typical power consumption of 22W under full load conditions, the lowest power consumption, highest density 10Gbps Ethernet switch chip in the industry. This makes the MB86C69RBC well-suited for environmentally conscious, low-power, green applications.

Eight priority classifications per port allow priority switching based on DiffServ, MAC address, VLANs, Extended VLANs and ports. Carrier-grade Ethernet features include priority PAUSE, backward-congestion notification and early drop capabilities for congestion avoidance. These features, in combination with the largest

buffer memory in the industry, allow the MB86C69RBC to handle both best-effort and guaranteed-high-availability customer traffic in a single chip.

In addition to the standard 4K VLAN and QinQ capabilities, the switch chip provides 64-user VLAN addresses that can be used to logically partition a network without the use of QinQ. VLAN translation capabilities allow users to translate VLANs from external customers to VLANs from internal providers.

The switch chip provides two 10/100/1000 Ethernet management interfaces. An agnostic interface allows the chip to communicate with any third-party processor. Two I<sup>2</sup>C interfaces and two MDIO interfaces permit low-speed communication with third-party external devices.

Both the switch and an integrated on-chip micro-engine can be initialized using an external EEPROM, simplifying the initialization sequence and allowing the user to customize the switch initialization. The on-chip micro-engine executes commands sent by the Ethernet management interface. This simplifies software development, increases flexibility and reduces time to market. The capability to initialize the switch through EEPROM also allows designers to bring up the switch along with the rest of the hardware without any software development in place.

The Fujitsu MB86C69RBC 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. The switch chip is well-suited for the L2+ switch box and the next-generation backplane fabric applications such as are seen in AdvancedTCA,  $\mu$ TCA and blade server platforms.

## FUJITSU MICROELECTRONICS AMERICA, INC.

Corporate Headquarters  
1250 E. Arques Avenue, M/S 333, Sunnyvale, CA 94085-5401  
Tel: (800) 866-8608 Fax: (408) 737-5999  
E-mail: [inquiry@fma.fujitsu.com](mailto:inquiry@fma.fujitsu.com) Web Site: <http://us.fujitsu.com/micro>

© 2008 Fujitsu Microelectronics America, Inc.  
All company and product names are trademarks or registered trademarks of their respective owners.  
Printed in the U.S.A. 10GE-FS-21297-3/2008