

Product Brief

10G Enhanced Ethernet Switch

The FM3000 series of fully integrated single-chip wire-speed 10G Ethernet switch chips are pin-compatible, enhanced versions of the industry-leading FM2000 Series. In addition to enhanced layer-2 functionality, FM3000 capabilities include the addition of advanced classification, extensive congestion management and improved switch management flexibility. All of this is accomplished while maintaining best-in-class latency and throughput.

Features

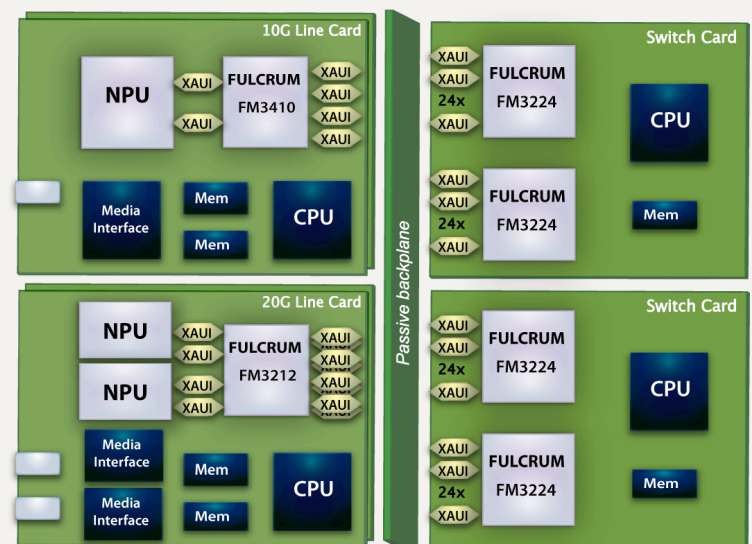
- **Performance**
 - 300ns latency with ACLs enabled
 - Up to 24 XAUI (CX4) interfaces
 - Each interface supports 10/100/1000/2500 SGMII
 - Cut-through and store-and-forward modes
- **Layer 2**
 - 16K-entry MAC table
 - Jumbo packet support up to 16,376 bytes
 - 16-port LAG filtering
 - 4K multicast groups with wire-speed replication
 - Multiple Spanning Tree support (802.1D, s, w)
 - Independent and shared VLAN learning
 - Extensive VLAN support including Q-in-Q
- **Advanced Policy Engine**
 - Deep packet inspection at 360 Mpps
 - L2/L3/L4 awareness
 - Up to 4K extended ACLs
 - Egress ACLs supported
 - Police, Drop, Count, Log, Mirror actions
 - Modify packet: New VLAN, Etype, DSCP
- **Switch virtualization and scaling**
 - Single point of management
 - Fat trees, meshes, rings
 - Hash-based load balancing
 - Remote learning
 - Multi-chip mirroring
- **Convergence capabilities**
 - 2K flow-based policers and counters
 - Class-based ingress rate limiting
 - 2MB of shared memory with 2 traffic class partitions
 - IEEE class-based pause frames
 - 8 class of service queues at each egress
 - Strict or DRR egress scheduling with traffic shaping
 - VCN frames to eliminate head-of-line blocking
- **Security**
 - Port-based security (802.1X)
 - MAC address security
 - DOS prevention
- **Switch management**
 - MDIO, GPIO, I²C, SPI interfaces
 - JTAG, and Serial LED interfaces
 - Unmanaged mode
 - In-band management option

Benefits

- **Reduces per-port cost of 10G Ethernet**
 - Simplifies and accelerates system design
 - Reduces component count
 - Accelerates the deployment of 10G infrastructure
- **Enables new performance-sensitive applications**
 - Telecom backplanes
 - High bandwidth packet processing
 - ATCA chassis architectures
- **Enhances existing applications**
 - Offers unprecedented multicast performance
 - Efficiently mixes voice, video, and data traffic
 - Efficient aggregation of enterprise LAN traffic
 - Provides a standards based solution to reduce cost
- **Enables differentiated services**
 - Memory partitions for traffic separation
 - Enhanced flow control for non-blocking operation
 - Advanced scheduling to meet service level agreements
- **Simplifies system-wide management**
 - Extensive monitoring offers clear visibility
 - Single point of management reduces complexity

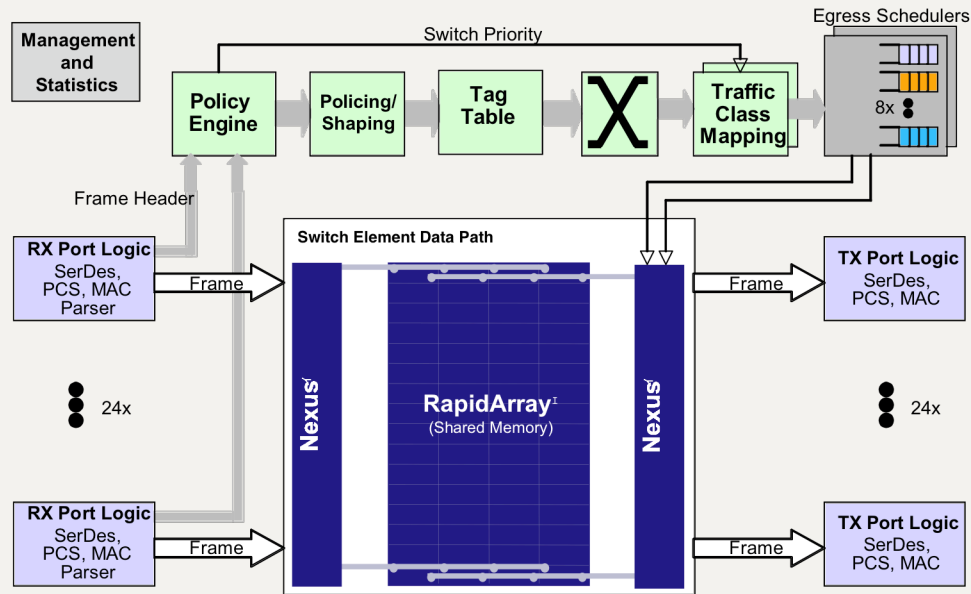
Sample Application

10G Ethernet Telecom Backplane



The FM3000's multitude of port options and extensive congestion management capabilities make it the perfect choice for implementing lossless backplanes on both the line card and the switch card.

FM3000 Functional Diagram



Leveraging the unique capabilities of Fulcrum's Nexus System Interconnect and ultra-fast RapidArray packet storage, the FM3000 Series delivers vast throughput with negligible delays, enabling a new class of performance-optimized applications never before imagined for Ethernet.

FM3000 Series Advances Telecom's Backplanes

The industry is beginning a migration to blade and modular system architectures, and system designers are attracted to the proposition of leveraging ubiquitous Ethernet to implement telecommunications backplanes, thus enabling them to create high-performance packet processing and communications systems while reducing complexity and cost. This demand was initially met with the FocalPoint FM2000 Series switches and now by the pin-compatible FM3000 Series, with enhanced Layer 2 features, providing designers with new tools to address a broader range of telecommunication networking demands.

The FM3000 Series continues to deliver an unprecedented level of performance and integration while performing advanced packet forwarding tasks. The FM3000 Policy Engine can perform deep packet inspection at up to 360mpps. Cost effective load balancing across a number of applications blades is made feasible through the use of the FM3000s efficient hashing capabilities. Advanced congestion management features enable highly flexible QoS implementations and security policies can be implemented and enforced through an extensive set of ACL rules.

FM3000 Series Eases System Design

The FM3000 Series devices are offered in a variety of port speed combinations to match a wide range of connectivity requirements. For added flexibility, all 10G interfaces may be operated in lower-speed modes.

FM3000	10G XAUI, 10/100/1000/2500 SGMII	10/100/1000/2500 SGMII
FM3103	2	4
FM3104	2	8
FM3410	8	10
FM3112	8	16
FM3208	8	-
FM3212	12	-
FM3224	24	-

Process and Power

The FM3000 Series devices are implemented in TSMC's 130nm FSG process and consume less than 1.5 Watt per active 10G interface with typical traffic activity. Unused interfaces that are disabled consume no power, and power scales directly with the level of activity.



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