

Product Brief

10G Ethernet Switch Chip Family

The FocalPoint FM2000 Series of fully integrated wire-speed Ethernet switch chips leads the market in low-latency intelligent switching, delivering cut-through latency as low as 200ns. With robust layer-2 switching capabilities and the ubiquity of Ethernet, the FM2000 Series provides solutions for a number of existing and emerging applications. With an unprecedented level of integration and a variety of device variants, FocalPoint removes the cost barrier for rapid and far-reaching deployment of 10G Ethernet. The FM2000 Series includes products ranging in size from the FM2224, which has 24 interfaces that can independently operate in 10G, 2.5G, 1G, 100M or 10M modes, down to the FM2103, which has two interfaces capable of 10G operation and four interfaces that operate in 2.5G, 1G, 100M or 10M modes.

Features

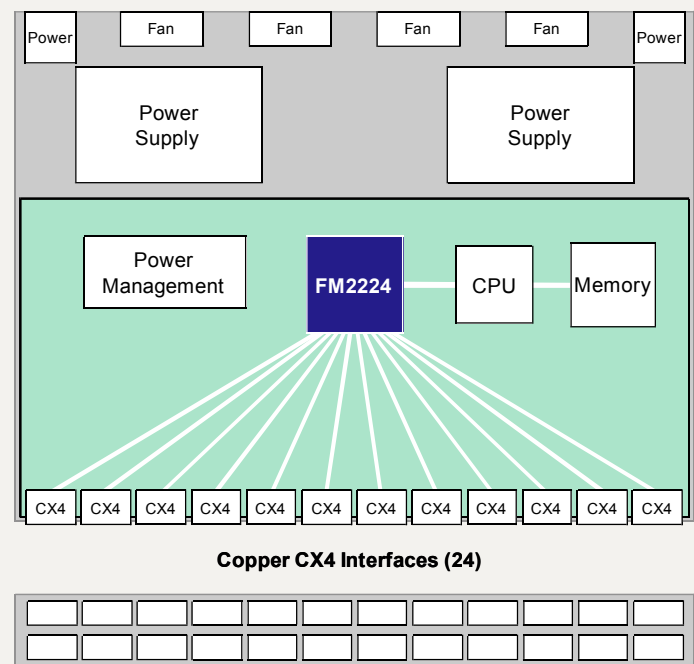
- **The industry's lowest latency**
 - 200ns, ball to ball
- **Up to 24 XAUI (CX4) interfaces**
 - CX4 compliant for copper cable support (up to 15m)
 - Also supports 10/100/1000/2500 SGMII modes
- **Performance-optimized design**
 - Cut-through (or store-and-forward)
- **Robust 802.3x PAUSE flow control**
 - Per-port configurable
 - Symmetric or asymmetric support
- **Sophisticated queue management**
 - 8 internal priority levels (802.1P support)
 - Programmable WRED
 - Strict priority and weighted round robin scheduling
 - Multicast/broadcast with programmable storm control
 - Jumbo packet support (up to 10KB)
- **Extensive 802.1Q VLAN support**
 - 4K-entry table
 - Port- or MAC-based association
 - Support for Q-in-Q (double-stacked) VLANs
- **MAC addresses**
 - 16K-entry table
 - Multiple Spanning Tree (802.1D, s, w)
 - Configurable hardware aging, with lockable entries
- **Programmable address look-up modes**
 - Configurable header offset (bypass proprietary header)
 - Hash lookup on configurable fields
- **Powerful 802.3ad link aggregation**
 - Support for any number of ports and groups
- **Port-based security (802.1X)**
 - Fully-programmable security actions
- **Extensive packet filtering/monitoring capabilities**
 - VLAN, SA, DA, Priority or Port based
 - Programmable rules for forward, redirect, discard, etc.
- **Sophisticated statistics gathering**
 - RMON, priority, flow, congestion control, VLAN
- **Robust configuration and service**
 - 32-bit generic CPU interface for system management
 - JTAG interface for debug and test
 - SPI for EEPROM boot and configuration
 - Serial interface for LED support
 - Managed and unmanaged operating modes
- **Modest and flexible power profile**
 - <1W per active 10G interface, typical

Benefits

- **Reduces per-port cost of 10G Ethernet**
 - Simplifies and accelerates system design
 - Reduces component count
- **Enables new performance-sensitive applications**
 - Blade computing, with RDMA
 - Computer room clusters and mesh-based systems
 - ATCA chassis architectures
- **Enhances existing applications**
 - Can aggregate enterprise LAN traffic
 - Drives the cost out of stackable Ethernet switches
 - Efficiently mixes voice, video, and data traffic
 - Offers unprecedented multicast performance
- **Simplifies system-wide management**
 - Extensive monitoring offers clear visibility
 - Programmable triggers provide efficient snooping

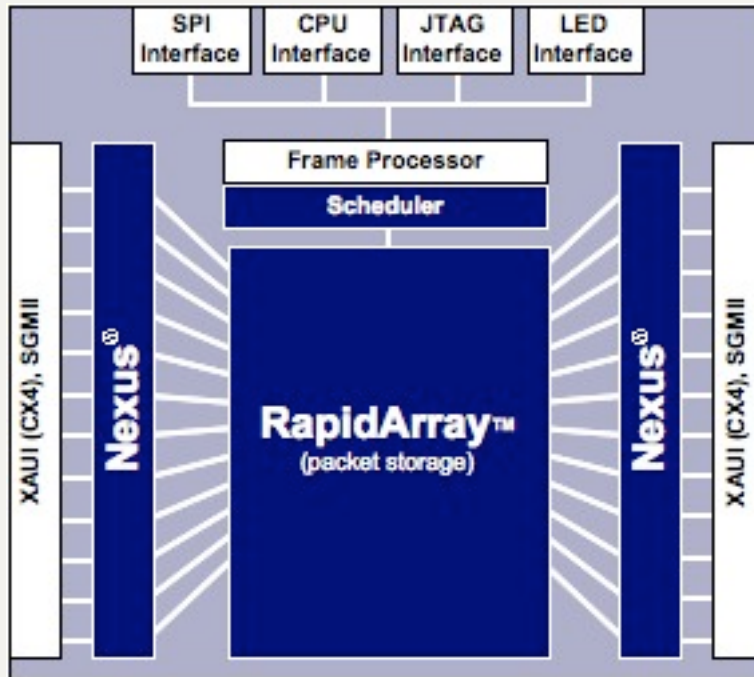
Sample Application

Stackable 10G Ethernet Switch



As a fully integrated solution, the FM2224 offers unparalleled performance and cost efficiency for full-speed 10G Ethernet connectivity. The device can be the core of a stackable switch, providing full-featured, low-latency switched interconnection between clustered computers in a data center.

FocalPoint Chip Architecture



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

FocalPoint Enables Modular Computing

As the industry begins its migration to blade and modular computing, system designers are attracted to the proposition of leveraging ubiquitous Ethernet to interconnect devices and create high-performance computing and communications systems, while reducing complexity and cost. Early-generation blade computers are based on 1G Ethernet. The software and related infrastructure is available and proven. Until now, high costs, poor performance, and limited integration have impeded the proliferation of 10G Ethernet into new compute and communications system designs.

The FocalPoint family delivers an unprecedented level of performance and integration, allowing system designers to build highly scalable systems, leveraging commodity CPU and IO components, while maintaining the ubiquitous Ethernet and IP software infrastructure that already exists in their systems. Also, with the emergence of storage software standards such as iSCSI and FCoE, the FocalPoint family can enable truly converged storage and data networks. The result is a new frontier of modular computing platforms where all three major system elements (compute, storage, and network) can be scaled independent of the others.

FocalPoint Family Variants

FM2224: 24-port 10G Ethernet switch chip, which contains 24 integrated XAUI SerDes interfaces, all of which can be independently configured to operate in 10 Gbps, or 10/100/1000/2500 SGMI modes.

FM2212: 12-port 10G Ethernet switch chip, with 12 configurable interfaces.

FM2208: 8-port 10G Ethernet switch chip, with 8 configurable interfaces.

FM2112: 24-port Ethernet switch chip, which contains 8 10G Ethernet interfaces and 16 lower-speed interfaces. All of the interfaces can be configured to operate in 2.5 Gbps and 10/100/1000 modes.

FM2104: 10-port Ethernet switch chip, with 2 10G Ethernet interfaces and 8 lower-speed interfaces, all of which can operate in 2.5 Gbps and 10/100/1000 modes.

FM2103: 6-port Ethernet switch chip, with 2 10G Ethernet interfaces and 4 lower-speed interfaces, all of which can operate in 2.5 Gbps and 10/100/1000 modes.