



Fibre Channel Controller

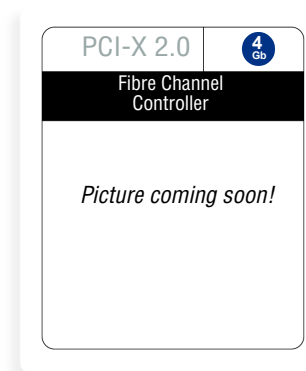
Dual Port 4-Gbps Fibre Channel (FC) to
PCI-X 2.0 266-MHz Controller

ISP2422M

The industry's first, true enterprise class 4-Gbps FC to PCI-X 2.0 266-MHz controller with integrated 1 MB of memory.

Key Features

- Integrated 512 KB synchronous static random access memory (SSRAM) per port.
- 4-Gbps FC increases aggregate throughput rates to 1.6 GBps in full-duplex mode.
- 64-bit, PCI-X 2.0 266-MHz dual data rate (DDR) bus for high throughput applications.
- 200,000 IOPS delivers high I/O transfer rates for storage applications.
- Intelligent interleaved DMA (iIDMA) ensures maximum utilization of all data links.
- Hardware assisted firmware tracing (HAFT) for real-time firmware debug capabilities.
- Out-of-order frame reassembly (OoOFR) reduces congestion and re-transmissions.
- Supports diagnostic monitoring interface (DMI) for detailed transceiver information.
- Management data input output (MDIO) interface to access and modify registers.
- T10 cyclic redundancy check (CRC) ensures end-to-end data integrity across SANs.
- Overlapping protection domains for continuous protection on internal data paths.
- Cisco VSAN frame tagging allows physical ports to be part of multiple logical networks.
- Multi-ID and N_Port virtualization allows a single port to acquire multiple N_Port IDs.
- Universal boot support handles multiple hardware platforms and boot options.



Standard Features

- 4/2/1 Gbps (auto-negotiation)
- Compatible with 66/33-MHz PCI and 133/100/66-MHz PCI-X systems
- SCSI initiator, target, and initiator/target modes
- Two general purpose input/output (GPIO) pins per port
- PCI extended capabilities: VPD, MSI, and power management
- JTAG boundary scan, full scan, and memory BIST

ISP2422M FC Controller. The ISP2422M is the industry's first dual port 4-Gbps to PCI-X 2.0 266-MHz controller that includes 512 KB of SSRAM memory per port. Unlike other FC controllers, the ISP2422M is a highly integrated, single chip design with unprecedented levels of performance. By eliminating external memory, the ISP2422M reduces the overall component footprint by over 50 percent, making it an ideal solution for embedded applications with real estate constraints.

Single-Chip Design. Incorporating high-speed 32-bit RISC processors, FC protocol modules (FPMs), integrated frame buffer memory, a PCI master bus interface, DMA channels, and SRAM memory into a single application specific integrated circuit (ASIC) package, each FC port utilizes its own separate internal resource to provide independent FC services and functions, allowing each port to operate concurrently with no performance degradation.

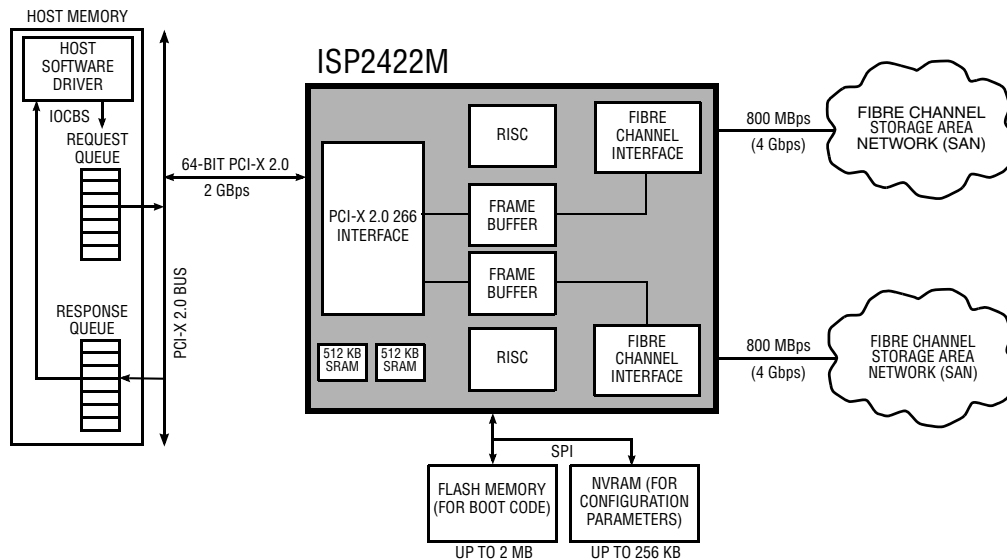
High Performance Architecture. The ISP2422M is the highest performing FC controller in the industry, delivering over 200,000 IOPS, nearly 2-GBps throughput, and supports the PCI-X 2.0 266-MHz DDR bus interface.

Stable, Proven Firmware. The result of more than 15 years of progressive development and testing, the firmware architecture delivers overall reliability and advanced functionality with its single-chip integration, placing QLogic years ahead of its competitors. In combination with the ASIC hardware, the firmware

reduces host intervention and interrupt overhead, executes multiple I/O control blocks from host memory, completes several I/O operations per single interrupt, and handles multithreading to fully utilize host bus and FC bandwidths.

Common Software Interface. Supporting a host software and firmware interface similar to existing and newly released products means rapid adoption of new features, capabilities, and technologies across all major operating systems and hardware platforms. Software development time is drastically reduced with common data structures, system calls, and APIs used across the controller software architecture. A common software interface speeds the development of reliable, interoperable storage products, giving application and system developers greater flexibility to meet time-to-market goals.

Investment Protection. For over 15 years, QLogic has been a technological leader by shipping products that address the current needs of customers, yet providing investment protection to support emerging technologies, standards, and protocols. In addition to supporting legacy bus interfaces, QLogic has a long-term commitment to support next generation bus interfaces, including PCI-X 1.0 and PCI-X 2.0. QLogic stands alone in the industry with its product portfolio depth and experience in successfully delivering technological solutions that address the needs of today and tomorrow.



Host Bus Specifications	
Bus interface	64-bit, PCI-X 2.0 266-MHz DDR, compatible with 66/33-MHz PCI and 133/100/66-MHz PCI-X
Signal voltage	3.3V (mode 1), 1.5V (mode 2)
Memory	Fixed 512 KB SRAM per port, addressable up 2-MB flash (SPI) and 256-KB NVRAM (SPI)
Compliance	PCI Local Bus Specification, revision 2.3, PCI-X Protocol Addendum to the PCI Local Bus Specification, revision 2.0a, PCI Bus Power Management Interface Specifications, revision 1.1
Fibre Channel Specifications	
Data rate	4/2/1 Gbps auto-negotiation (4.25/2.125/1.0625 Gbps)
Performance	100,000 IOPS per port
Throughput	400 MBps maximum at half-duplex per port, 800 MBps maximum at full-duplex per port
Topology	Point-to-point (N_Port), arbitrated loop (NL_Port), and switched fabric (N_Port)
Class of service	Class 2 and 3
Protocols	FCP (SCSI-FCP), IP (FC-IP), FICON (FC-SB-2), FC-TAPE (FCP-2)
Buffer credits	3 credits available (2,112 Byte frame payload)
Compliance	SCSI-3 Fibre Channel Protocol (SCSI-FCP), Fibre Channel Physical and Signaling Interface (FC-PH), Fibre Channel 2nd Generation (FC-PH-2), Third Generation Fibre Channel Physical and Signaling Interface (FC-PH-3), Fibre Channel—Arbitrated Loop (FC-AL-2), Fibre Channel Fabric Loop Attachment Technical Report (FC-FLA), Fibre Channel—Private Loop Direct Attach Technical Report (FC-PLDA), Fibre Channel Tape (FC-TAPE) profile, SCSI Fibre Channel Protocol-2 (FCP-2), Second Generation FC Generic Services (FC-GS-3), Third Generation FC Generic Services (FC-GS-3), Fibre Channel Framing and Signaling (FC-FS)
Physical Specifications	
Ports	Dual 4-Gbps FC
Package	622-pin plastic ball grid array multi-layer thermally enhanced (PBGAMT)
Dimensions	40 mm × 40 mm
Pin pitch	1.27 mm
Environment and Equipment Specifications	
Temperature	100°C junction temperature
Airflow	200 LFM (1.0 m/sec)
Voltage	Core: 1.2V; I/O: 3.3V, 2.5V; analog (SERDES): 1.2V, 1.5V (optional)
Power dissipation	5.5 W (estimate)
Ordering Information	
ISP2422M-B0	Integrated memory version ships in a single tray (quantity 24) or block of 10 trays (quantity 240)
ISP2422M-B0R	RoHS compliant integrated memory version ships in a single tray (quantity 24) or block of 10 trays (quantity 240)



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