


# Cisco MGX PXM-1 Processor Switch Module



The Cisco MGX™ PXM-1 Processor Switch Module is a combination ATM switching fabric, data processing, and ATM interface card used on the Cisco MGX 8230, 8250, and 8850 switches. The Cisco MGX PXM-1 Module combines a 1.2-Gbps shared-memory switching fabric with integrated trunking at speeds up to OC-12. The switching fabric provides 1.2 Gbps of nonblocking switching capacity, while the processor provides the control plane that delivers advanced IP+ATM networking software, diagnostics, and performance monitoring.

## Key Features

- Integrated switching, processing, and broadband interfaces, which provide high-performance switching and trunking on a single card
- Route Processor Module (RPM) 1: Redundancy
- 1.2 Gbps nonblocking switching
- Integrated T3/E3, OC-3c/STM-1, OC-12c/STM-4 ATM trunking
- Linear automatic protection switching (APS) for the Synchronous Optical Network (SONET) interfaces
- Hot card insertion/removal
- 1:1 hot-standby redundancy
- User-selectable primary and secondary clock sources with graceful switchover
- Internal Stratum-4 or optional Stratum-3, external building integration timing supply (BITS), or inband clock sources
- Inband management or out-of-band via EIA/TIA-232 or 10BaseT control ports
- Narrowband service modules
- Broadband trunking support
- Support for DS0 to OC-12c/STM-4 interfaces

Figure 1 Cisco MGX 8850 PXM-1 Processor Switch Module



The Cisco PXM-1 and MGX Universal Chassis provides a unified IP+ATM architecture that can deliver multiple services, from Frame Relay and circuit emulation services to IP VPNs, on a single chassis.

The Cisco MGX PXM-1 Module combines ATM switching and ATM trunking on a single card. The Cisco MGX PXM-1 trunk and UNI ports operate at the standard T3/E3 and SONET/Synchronous Digital Hierarchy (SDH) rate of 155.520 or 622.08 Mbps.

### Technical Specifications

#### ATM Switch Fabric Card

- Resides in slots 1 and 2 of the Cisco MGX 8230
- Resides in slots 7 and 8 of the Cisco MGX 8850 and 8250
- Supports hot insertion and removal
- Supports 1:1 hot-standby redundancy
- Offers R4700 MIPS CPU
- Offers 1.2 Gbps worth of nonblocking switching
- Provides 2.1-multigigabit hard drive
- Provides full environmental monitoring of cabinet temperature, cooling fan speeds, and supply voltages
- Provides four LED indicators
  - Card status
  - Major/minor network alarms
  - LAN control port activity detect
  - DC power status



Supports two back cards:

- Upper back card supports the following functions:

User and management interfaces

- EIA/TIA-232 control port
- EIA/TIA-232 maintenance port
- 10BaseT Ethernet port

Network synchronization for the shelf

- T1/E1 BITS synchronization port
- Stratum-4E clocking
- Stratum-3 clocking (optional)
- Conformance to ATT Pub. 62411

Central office-compatible major/minor alarm interface

- DB-15 connector
- Major alarm audio
- Major alarm visual
- Minor alarm visual

- Lower back card provides one of the following ATM interfaces:

- Two-port T3/E3
- Four-port OC-3c/STM-1
- One-port OC-12/STM-4

Physical-Layer T3/E3 Interface

- Two T3/E3 ports
- Complies with ATM Forum UNI Specification Versions 3.0, 3.1
- 1:1 PXM1 redundancy

Table 1 T3/E3 Interface Physical Characteristics

Characteristic	T3 (DS3)	E3 (34 Mbps)
Line Rate	44.736 Mbps 20 ppm	34.368 Mbps 20 ppm
Line Code	B3ZS	HDB3
Cell Transfer Rate	96,000 cells/sec	80,000 cells/sec
Framing	ANSI T1.107, T1.107a	ITU-T G.804, G.832
Signal Level	TA-TSY-00077 TA-TSY-000773 TA-TSY-000772	ITU-T G.703
Connector	Locking	Locking
Cell Mapping	PLCP Direct	PLCP Direct

Physical Layer OC-3c STM-1 Interface

- Four OC-3c/STM-1 (155.520-Mbps) ports
- Trunk or port interface mode
- Cell transfer rate of 353,208 cells per second
- Compliant with SONET standards
  - Bellcore GR-253-CORE
  - ANSI T1.105
- Compliant with SDH standards
  - ITU-T G.707, G. 708, and G.709
  - ITU-T G. 957, G.958
  - ITU-G.783 Annex-A
- 1:1 PXM1 redundancy
- ITU-G.783 Annex-A

Physical Layer OC-12c/STM-4 interface

- One OC-12c/STM-4 (622.08-Mbps) port
- Cell transfer rate of 1,412,832 cells per second
- Compliant with SONET standards
  - Bellcore GR-253-CORE, TR-TSY-000020
  - ANSI T1.105
- Compliant with SDH standards
  - ITU-T G.707, G.708, and G.709
  - ITU-T G.957, G.958
  - ITU G.783 Annex-A



- 1:1 PXM1 redundancy
- OC-12 fiber-optic interface options

Table 2 OC-3c STM-1 Interface Physical Characteristics

OC-3c/ STM-1		Tx Power (dBm)		Rx Range (dBm)		Physical	Range (km)
Back Card	Source 1310 nm	Min	Max	Min	Max		
MMF	LED	-22	-15	-31	-10	SC	2
SMF (R)	Laser (Class 1)	-15	-8	-28	-8	SC	15
SMF (LR)	Laser (Class 1)	-5	0	-34	-10	SC	40

Table 3 OC-12c/STM-4 Interface Physical Characteristics

OC-12c/STM-4		Tx Power (dBm)		Rx Range (dBm)		Physical	Range (km)
Back Card	Source	Min	Max	Min	Max		
SMF (IR)	Laser 1310 nm	-15	-8	-28	-8	SC	15
SMF (LR)	Laser 1310 nm	-5	10	-28	-8	SC	40

#### ATM Layer

- Configurable for trunk and public or private User-Network Interface (UNI) application
- UNI compliant to ATM Forum UNI Specifications V.3.0 and V.3.1, and ITU-T I.361 and I.432 specifications
- Complies with standard usage parameter control (UPC) and connection admission control (CAC) per ATM Forum UNI Specification V.3.1 and ITU-T I.371
- Supports virtual circuit connections (VCCs) and virtual path connections (VPCs) per ATM Forum UNI Specification V.3.1 and ITU-T I.371
- Connections
  - 16,000 connections per chassis
  - 4,000 UNI connections per card
- Virtual path identifier/virtual channel identifier (VPI/VCI) range for VCCs and VPCs: per UNI Specification 3.1

#### Traffic Management

- CBR, rt-VBR, nrt-VBR, UBR, ABR-STD, ABR-FST
- Up to 16 classes of service (CoSs) with the following configurable parameter
  - Service priority level (SPL)

## Virtual Trunks

- Support for up to 32 virtual interfaces per card, each with 16 CoS queues
- VPI/VCI used to identify virtual connection
- Virtual interface parameters:
  - Physical port (trunk or UNI)
  - Peak service rate (PSR)
  - Maximum service rate
  - Maximum resource allocation

## Cell Buffering

- Large ingress and egress cell buffer architecture
- 128,000 cells stored per card
  - Accommodate large traffic bursts
  - Avoid network congestion and cell discard
  - Suited to TCP/IP traffic

## Intelligent Quality-of-Service Management Suite

### Advanced CoS Management

- Up to 16 CoS queues, with independent service algorithms dedicated to each interface in the network

### Optimized Bandwidth Management

- Dedicated queue- and rate-controlled servers for each VCC/VPC
- Dynamic bandwidth management, providing more than 95-percent utilization

### Network Management

- Management using Cisco WAN Manager Software 10.4.10 supports software release 1.1.40 only when deployed with 1.1.34 features.
- CiscoView for equipment management
- Simple Network Management Protocol (SNMP) based for configuration and statistics collection
- Graphical user interface

### Physical Specifications

- Dimensions: (H x D) 15.83 x 15.65 in.

### Electrical Specifications

- Input power required: –48 VDC
- Power consumption: 100W

## Electrical and Safety Standards Compliance

- EMI/ESD compliance
  - FCC Part 15
  - Bellcore GR1089-CORE
  - IEC 801-2
  - EN55022
- Safety compliance
  - EN 60950
  - UL 1950
- Bellcore NEBS: Level 3 compliant
- Optical safety: IEC 825-1 (Class 1)



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