



Cisco MGX 8000 Series Multiservice Switch Broadband ATM Switching Module

The Cisco MGX[®] 8000 Series Multiservice Switch Broadband ATM Switching Module (AXSM) can be used with the Cisco MGX 8850 PXM-45 or the Cisco MGX 8950 Multiservice Switches to deliver broadband connectivity from T3/E3 up to OC-48c/STM 16 speeds.

The class of service (Cos) queue architecture of the Cisco AXSM offers the industry's most advanced and reliable multiservice networking features. These features include Private Network-Network Interface (PNNI), switched virtual circuit/path (SVC/SVP), soft permanent virtual circuit/path (SPVC/SPVP), and Multiprotocol Label Switching (MPLS).

AXSM Ports

- 16 x T3/E3
- 16 x OC-3c/STM-1
- 4 x OC-12c/STM-4
- 1 x OC-48c/STM-16

Key Features

- Each port is configurable for either trunk or access applications
- Each OC-48c/STM-16 delivers fully non-blocking, full-duplex through-put
- Up to 16 ATM service classes are supported
- Carrier-class implementation of standards-based PNNI, SVC/SVP and MPLS services are supported
- Large cell buffers (one million cell) help to maximize "goodput" performance during congestion
- Dynamically allocated buffers depending on connection resource needs, thereby optimizing use of system resources
- High reliability with hot-standby 1:1 AXSM card redundancy, 1:1 and 1+1 line redundancy using automatic protection switching (APS)

Key Applications

- Broadband aggregation

Technical Specifications

Physical Layer T3/E3 Interface

- Supports ports and trunks on same Cisco AXSM module
- Supports User-Network Interface (UNI) specifications 3.0, 3.1, and 4.0

Table 1 Cisco MGX[®] 8000 Series AXSM T3/E3 Module connection specifications

Type of back card	T3	E3
Port speed	44.736 Mbps	34.368 Mbps
Cell transfer rate	96,000 cells/sec	80,000 cells/sec
Number of ports per Cisco AXSM module	16	16
Line coding	B3ZS ¹	HDB3 ²
Line framing	ANSI T1.107, T1.107a	ITU-T G.804, G.832
Port media	75-ohm coaxial	75-ohm coaxial
Port connector	SMB ³	SMB
Cell mapping	PLCP ⁴ Direct	PLCP Direct
Redundancy	1:1, Y-cable	1:1, Y-cable

¹Binary 8-zero substitution

²High-density bipolar with three zeros

³Small/medium business

⁴Physical layer convergence procedure

Physical Layer OC-3c/STM-1 Interface

- Supports ports and trunks on same Cisco AXSM module
- Supports User-Network Interface (UNI) specifications 3.0, 3.1, and 4.0
- Compliant with Synchronous Optical Network (SONET) standards
 - Bellcore GR-253-CORE
 - ANSI T1.105
- Compliant with Synchronous Digital Hierarchy (SDH) standards
 - ITU-T G.707, G.708, and G.709
 - ITU-T G.957 and G.958

Table 2 Cisco MGX[®] 8000 Series AXSM OC-3c/STM-1 Module connection Specifications

Type of back card	STM-1 electrical	MMF ¹	SMF-IR ²	SMF-LR ³
Port speed	155 Mbps	155 Mbps	155 Mbps	155 Mbps
Cell transfer rate	353,208 cells/sec	353,208 cells/sec	353,208 cells/sec	353,208 cells/sec
Number of ports per Cisco AXSM module	8	16	16	16
Port media	75-ohm coaxial	MMF	SMF	SMF
Port connector	SMB	MT-RJ	LC	LC
Optics	–	Laser 1310 nm	Laser 1310 nm	Laser 1310 nm
Tx Power Level (dBm)	–	–15 min –8 max	–15 min –8 max	–5 min 0 max
Rx Power Level (dBm)	–	–23 min –8 max	–28 min –8 max	–34 min –10 max
Typical Reach/Km	–	2	15	40
Redundancy	1:1, Y-cable, 1+1 and 1:1 APS	1+1 and 1:1 APS	1:1, Y-cable, 1+1 and 1:1 APS	1:1, Y-cable, 1+1 and 1:1 APS

¹Multimode frequency

²Single-mode frequency, intermediate reach

³Single-mode frequency, long reach

Physical Layer OC-12c/STM-4 Interface

- Supports ports and trunks on same Cisco AXSM module
- Supports UNI specifications 3.0, 3.1, and 4.0
- Compliant with SONET standards
 - Bellcore GR-253-CORE, TR-TSY-000020
 - ANSI T1.105
- Compliant with SDH standards
 - ITU-T G.707, G.708, G.709
 - ITU-T G.957, G.958

Table 3 Cisco MGX[®] 8000 Series AXSM OC-12c/STM-4 Module connection specifications

Type of back card	SMF-IR	SMF-LR
Port speed	622 Mbps	622 Mbps
Cell transfer rate	1,412,832 cells/sec	1,412,832 cells/sec
Number of ports per Cisco AXSM module	4	4
Port media	SMF	SMF
Port connector	SC	SC
Optics laser	Laser 1310 nm	Laser 1310 nm
Transmit power level (dBm)	–15 min –8 max	–3 min +2 max
Receive power level (dBm)	–28 min –8 max	–28 min –8 max
Typical reach per kilometer	15	40
Redundancy	1:1, Y-cable, 1+1 and 1:1 APS	1:1, Y-cable, 1+1 and 1:1 APS

Physical Layer OC-48c/STM-16 Interface

- Supports ports and trunks on same Cisco AXSM module
- Supports UNI specifications 3.0, 3.1, and 4.0
- 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

Table 4 Cisco MGX[®] 8000 Series AXSM OC-48c/STM-16 Module connection specifications

Type of back card	SMF-SR	SMF-LR	SMF-XLR ¹
Port speed	2.4 Gbps	2.4 Gbps	2.4 Gbps
Cell transfer rate	5,651,328 cells/sec	5,651,328 cells/sec	5,651,328 cells/sec
Number of ports per Cisco AXSM module	1	1	1
Port media	SMF	SMF	SMF
Port connector	SC	SC	SC
Optics	Laser 1310 nm	Laser 1310 nm	Laser 1550 nm
Transmit power level (dBm)	–10 min –3max	–2 min +3 max	–2 min +3 max
Receive power level (dBm)	–18 min –3 max	–27 min –9 max	–27 min –9 max
Typical reach per kilometer	2	40	80
Redundancy	1:1, Y-cable, 1+1 and 1:1 APS	1:1, Y-cable, 1+1 and 1:1 APS	1:1, Y-cable, 1+1 and 1:1 APS

¹Single-mode fiber, extra-long reach

Network Synchronization

- Configurable for internal timing from the internal Cisco PXM-45 Layer 3 clock
- System clock synchronization to any service module port
- T1/E1 Building Integrated Timing Supply (BITS) synchronization port

ATM Layer

- Conforms to ATM Forum UNI 3.0, 3.1, and 4.0 and ITU-T I.361 and I.432 specifications
- Supports IP quality of service (QoS) based on differentiated services (Diff-Serv)
- Supports Integrated Local Management Interface (ILMI) 4.0
- Complies with standard Usage Parameter Control (UPC) per ATM Forum UNI 3.x, TM 4.0, and ITU-T I.371
- Supports early packet discard (EPD), Weighted Random Early Detection (WRED) and partial packet discard (PPD)
- Supports virtual circuit connections (VCCs) and virtual path connections (VPCs)
- Supports up to 128,000 connections per Cisco AXSM module controlled by Private Network-Network Interface (PNNI)
- Supports virtual path identifier (VPI) and virtual channel identifier (VCI) range for VCCs and VPCs per UNI 3.1
- Supports virtual channel merge and multipoint connections

Virtual Trunks

- Supports maximum of 64 virtual interfaces per module; the interfaces can be ports, trunks, or virtual trunks

Cell Buffering

- Supports one million cells of buffering to accommodate large traffic bursts, avoiding network congestion and cell discard; suitable for TCP/IP traffic

Support for Dynamic Routing Using PNNI

- Provides automatic end-to-end connection management mechanism
- Deterministically allocates bandwidth and reroutes connections autonomously over optimum network paths
- Preserves service integrity during network failure
- Offers E.164/NSAP addressing
- Offers QoS-based routing

Enhanced Call Admission Control

- A user-programmable Call Admission Control (CAC) feature (Enhanced CAC [E-CAC]) decides whether to admit or deny connections based upon the requested QoS.

Statistics

- Statistics supported using user-configurable bucket intervals
- Billing statistics supported on T3/E3, OC-3c/STM-1, and OC-12c/STM-4 interfaces
- Diagnostic statistics available per interface, CoS queues, and connections

Operation, Administration, and Management

- Supports F4 to F5 fault propagation
- Supports inband diagnostics using loopback cells
- Supports inband continuity checks and automatic fault reporting for PVCs
- Supports loopback facility for diagnostics and self-test purposes

Network Management

- Managed by Cisco WAN Manager Software suite
- Based on standards-based Simple Network Management Protocol (SNMP)

Physical Specifications

- Dimensions: (H x D): 15.83 x 15.65 in. (40.20 x 39.75 cm)

Electrical Specifications

- Input power required: -48 VDC
- Power consumption: 95W

Electrical, Safety, and 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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