

Cisco MGX 8800/8900 8-Port OC-12/STM-4 Channelized/Unchannelized ATM Service Module

Product Overview

The Cisco MGX[®] 8800/8900 Series Switches provide the industry's most scalable family of multiservice switches, scaling from 1.2 Gbps to 180 Gbps redundant switching capacity and from DS0 to OC-192/STM-64 interface capacity. This scalability provides exceptional savings and efficiency for network operations and services growth. The Cisco[®] MGX 8800 Series includes the Cisco MGX 8880 Media Gateway and the Cisco MGX 8830/B, MGX8850, MGX 8850/B, and MGX 8950 Multiservice Switches.

The Cisco 8-Port OC-12/STM-4 Channelized/Unchannelized ATM Switch Service Module is a line card for use in the Cisco MGX 8800/8900 Series multiservice Cisco MGX Switches in combination with the Cisco MGX 8800/8900 PXM-45 Processor Switch Module and the Cisco MGX 8950 XM-60 Switching Module (the latter for use on the Cisco MGX 8950 only). This ATM switch service module has 8 physical 622-Mbps interfaces that can be used to deliver high-density OC-12 or STM-4 trunking and User-Network Interface (UNI) or aggregation of sub-OC-12 traffic through port channelization.

Up to 12 Cisco 8-port OC-12/STM-4 ATM Switch Service Modules can reside in the Cisco MGX 8850, MGX 8850/B, MGX 8880, or MGX 8950 to provide support for up to 96 OC-12c/STM-4 interfaces for service providers that require both high bandwidth and high network availability. In the smaller Cisco MGX 8830/B chassis, up to 4 such service modules can be configured.

The Cisco 8-Port OC-12/STM-4 Channelized/Unchannelized ATM Switch Service Module meets service providers' demand for carrier-class availability by offering hot-standby 1+1 card redundancy as well as port redundancy with SONET/SDH automatic protection switching (APS). (See Figure 1.)

Figure 1. Cisco MGX 8800/8900 8-Port OC-12/STM-4 Channelized/Unchannelized ATM Service Module



Key Features

The main features of the Cisco 8-Port OC-12/STM-4 Channelized/Unchannelized ATM Switch Service Module are listed here.

- Full nonblocking, full-duplex line-rate throughput on all 8 ports when used on the Cisco MGX 8950 chassis
- Up to 4 ports with nonblocking, full-duplex line-rate throughput when used on the Cisco MGX 8800 chassis
- Individual port channelization down to DS-3 and OC-3c/STM-1
- Per-virtual-path and per-virtual-circuit traffic shaping and available bit rate (ABR) with virtual source and virtual destination
- APS (1:1 and 1+1) port redundancy, plus APS 1+1 card redundancy
- Up to 4 million cell buffers
- Up to 16 classes of service (CoS) that can be used to support IP or ATM services
- Support for standards-based Private Network-to-Network Interface (PNNI), switched virtual circuit (SVC) and switched virtual path (SVP), soft permanent virtual connection (SPVC) and soft permanent virtual path (SPVP), and Multiprotocol Label Switching (MPLS) services

Technical Specifications

Table 1 lists the specifications for the Cisco 8-Port OC-12/STM-4 Channelized/Unchannelized ATM Switch Service Module.

Table 1. Product Specifications

Description	Specification
Chassis Compatibility	Cisco MGX 8830/B, MGX 8850, MGX 8850/B, MGX 8880, and MGX 8950
Software Compatibility	<ul style="list-style-type: none"> • Cisco MGX 8800/8900 Software Release 5.2.00 and above for Cisco MGX 8830/B, MGX 8850, MGX 8850/B, and MGX 8950 • Cisco MGX 8800/8900 Software Release 5.3.00 and above for Cisco MGX 8880
Protocols	ATM and SONET/SDH
Port Density	8 ports (4 ports at full line rate on the Cisco MGX 8800 chassis)
Layer 1 (Physical Layer) Feature Summary	<ul style="list-style-type: none"> • Support for ports and trunks on the same Cisco 622-Mbps 8-port ATM switch service module • User-Network Interface (UNI) 3.0, 3.1, and 4.0 physical layer specifications • Compliance with the following SONET standards: <ul style="list-style-type: none"> ◦ Bellcore GR-253-CORE ◦ ANSI T1.105 • Compliance with the following SDH standards: <ul style="list-style-type: none"> ◦ ITU-T G.707, G.708, G.709, and G.783 ◦ ITU-T G.957 and G.958 <p>Note: The Cisco MGX 8800/8900 8-Port OC-12/STM-4 Channelized/Unchannelized ATM Service Module marginally exceeds jitter generation as specified by Telcordia GR-253 when tested in loop timing mode (that is, when the TX (Transmit) of a specific port redistributes its own line-recovered clock to other systems). However, jitter generation for the remaining ports is well within the limits specified by the GR-253 standard. Empirical testing has shown that the marginally higher jitter generation in loop timing mode should have no effect on the functional performance of the Cisco MGX 8800/8900 8-Port OC-12/STM-4 Channelized/Unchannelized ATM Service Module</p>

Description	Specification																														
Layer 1 (Physical Layer) Feature Summary (continued)	Additional Physical Layer Specifications for Ports and Optics																														
	<table border="1"> <thead> <tr> <th>Connection Options</th> <th>SMF-IR¹</th> <th>SMF-LR²</th> </tr> </thead> <tbody> <tr> <td>Port speed</td> <td>622 Mbps</td> <td>622 Mbps</td> </tr> <tr> <td>Number of ports per Cisco MGX 8800/8900 8-Port OC-12/STM-4 Channelized/Unchannelized ATM Service Module</td> <td>8</td> <td>8</td> </tr> <tr> <td>Port media</td> <td>SMF</td> <td>SMF</td> </tr> <tr> <td>Port connector</td> <td>LC</td> <td>LC</td> </tr> <tr> <td>Optics (nanometers – [nm])</td> <td>Laser 1310 nm</td> <td>Laser 1310 nm</td> </tr> <tr> <td>Transmit power level (decibels per milliwatt [dBm])</td> <td>–15 minimum and –8 maximum</td> <td>–3 minimum and 2 maximum</td> </tr> <tr> <td>Receive power level (dBm)</td> <td>–28 minimum and –8 maximum</td> <td>–28 minimum and –8 maximum</td> </tr> <tr> <td>Typical reach</td> <td>15 km (9.3 mi)</td> <td>40 km (24.85 mi)</td> </tr> <tr> <td>Redundancy</td> <td> <ul style="list-style-type: none"> • 1+1 and 1:1 APS port • 1+1 APS card </td> <td> <ul style="list-style-type: none"> • 1+1 and 1:1 APS port • 1+1 APS card </td> </tr> </tbody> </table>	Connection Options	SMF-IR ¹	SMF-LR ²	Port speed	622 Mbps	622 Mbps	Number of ports per Cisco MGX 8800/8900 8-Port OC-12/STM-4 Channelized/Unchannelized ATM Service Module	8	8	Port media	SMF	SMF	Port connector	LC	LC	Optics (nanometers – [nm])	Laser 1310 nm	Laser 1310 nm	Transmit power level (decibels per milliwatt [dBm])	–15 minimum and –8 maximum	–3 minimum and 2 maximum	Receive power level (dBm)	–28 minimum and –8 maximum	–28 minimum and –8 maximum	Typical reach	15 km (9.3 mi)	40 km (24.85 mi)	Redundancy	<ul style="list-style-type: none"> • 1+1 and 1:1 APS port • 1+1 APS card 	<ul style="list-style-type: none"> • 1+1 and 1:1 APS port • 1+1 APS card
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¹ Single-mode fiber, intermediate reach																															
² Single-mode fiber, long reach																															
Layer 2 (ATM) Feature Summary	<ul style="list-style-type: none"> • Configurable for trunk, Network-to-Network Interface (NNI), or UNI application • Conformant to ATM Forum UNI 3.0, 3.1, and 4.0 and ITU-T I.361 and I.432 specifications • Supports up to 16 CoS queues for IP and ATM traffic and includes all ATM Forum traffic-type services: ABR, unspecified bit rate (UBR), non-real-time variable bit rate (VBR-nrt), real-time variable bit rate (VBR-rt), constant bit rate (CBR); ABR supported with explicit forward congestion indicator (EFCI), RM marking, and explicit-rate stamping; supports ABR virtual source and destination • Supports Integrated Local Management Interface (ILMI) 4.0 • Complies with standard usage parameter control (UPC) per ATM Forum UNI 3.0 and 4.0, TM 4.1, 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 8-port ATM switch service module controlled by PNNI • Supports virtual path identifier (VPI) and virtual circuit identifier (VCI) range for VCCs and VPCs per UNI 3.1 • Supports virtual circuit merge, per-virtual-circuit and per-virtual-path shaping, and multipoint connections <p>Virtual trunks</p> <ul style="list-style-type: none"> • Supports a maximum of 128 virtual interfaces per module; the interfaces can be ports, trunks, or virtual trunks; each virtual interface supports 16 CoS queues <p>Cell buffering</p> <ul style="list-style-type: none"> • Supports 4 million cells of buffering to accommodate large traffic bursts and avoid network congestion and cell discard; suitable for TCP/IP traffic <p>Support for dynamic routing using PNNI 1.0</p> <ul style="list-style-type: none"> • Offers an 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 and network-service-access-point (NSAP) addressing • Offers support for SVC and SVP and for SPVC and SPVP • Offers quality of service (QoS) based routing <p>Enhanced call admission control</p> <ul style="list-style-type: none"> • A user-programmable Enhanced Call Admission Control (E-CAC) feature determines whether to admit or deny connections based on the requested QoS. 																														

Description	Specification
Layer 2 (ATM) Feature Summary (continued)	Statistics <ul style="list-style-type: none"> Statistics supported per connection Diagnostic statistics available per interface and CoS queues Operation, administration, and management <ul style="list-style-type: none"> F4 to F5 fault propagation In-band diagnostics support using loopback cells In-band continuity check and automatic fault reporting for PVCs Loopback facility support for diagnostics and self-test purposes
Network Management	<ul style="list-style-type: none"> Managed by Cisco WAN Manager software suite Based on Simple Network Management Protocol (SNMP)
Power	<ul style="list-style-type: none"> Input power required: –48 VDC Power consumption: 134W
Physical Dimensions	H x D: 15.83 x 15.65 in. (40.20 x 39.75 cm)
Weight	6.5 lb (2.95 kg)
Environmental Conditions	<ul style="list-style-type: none"> Storage temperature: –40 to 158°F (–40 to 70°C) Operating temperature: <ul style="list-style-type: none"> Normal: 41 to 104°F (5 to 40°C) Short term: 23 to 122°F (–5 to 50°C) Relative humidity: <ul style="list-style-type: none"> Normal: 5 to 85% Short term: 5 to 90% but not to exceed 0.024 kg (0.048 lb) of water per kg (lb) of dry air Short term refers to a period of not more than 96 consecutive hours and a total of not more than 15 days in 1 year.

Approvals and Compliance

Table 2 lists regulatory information.

Table 2. Compliance and Agency Approvals

Compliance Type	Description
Safety standards	<ul style="list-style-type: none"> UL/CSA/IEC/EN 60950-1 IEC/EN 60825 Laser Safety ACA TS001 AS/NZS 60950 FDA-Code of Federal Regulations Laser Safety
EMI	<ul style="list-style-type: none"> FCC Class A ICES 003 Class A AS/NZS 3548 Class A CISPR 22 (EN55022) Class A VCCI Class A BSMI Class A IEC/EN 61000-3-2: Power Line Harmonics IEC/EN 61000-3-3: Voltage Fluctuations and Flicker
Immunity (basic standards)	<ul style="list-style-type: none"> IEC/EN-61000-4-2: Electrostatic Discharge Immunity (8 kV Contact and 15 kV Air) IEC/EN-61000-4-3: Radiated Immunity (10 V/m) IEC/EN-61000-4-4: Electrical Fast Transient Immunity (2 kV AC Power and 1 kV DC Power) IEC/EN-61000-4-5: Surge AC Port (2 kV CM and 2 kV DM) IEC/EN-61000-4-5: Signal Ports (1 kV) IEC/EN-61000-4-5: Surge DC Port (1 kV) IEC/EN-61000-4-6: Immunity to Conducted Disturbances (10 Vrms) IEC/EN-61000-4-8: Power Frequency Magnetic Field Immunity (30 A/m) IEC/EN-61000-4-11: Voltage DIPS, Short Interruptions, and Voltage Variations

Compliance Type	Description
Network Equipment Building Systems (NEBS)	This product is designed to meet the following requirements (qualification in progress): <ul style="list-style-type: none"> • SR-3580: NEBS Criteria Levels (Level 3) • GR-1089-CORE: NEBS EMC and Safety • GR-63-CORE: NEBS Physical Protection
Telcordia CLEI	<ul style="list-style-type: none"> • GR-485-CORE – CLEI coding • GR-383-CORE – CLEI code product label • GR-209-CORE – PCN process

Ordering Information

Table 3 lists ordering information for the Cisco MGX 8800/8900 8-Port OC-12/STM-4 Channelized/Unchannelized ATM Service Module. To place an order, visit the [Cisco Ordering Home Page](#).

Table 3. Ordering Information

Part Number	Product Name
AXSM-8-622-XG	Double-height ATM VS/VD service module, 8 OC-12/STM-4, channelized/unchannelized
SFP-4-622	4-port SFP back card for OC-12/STM-4
SMFIR-622-SFP	622/STM4 Single Mode Intermediate Reach SONET SFP
SMFLR-622-SFP	622/STM4 Single Mode Long Reach SONET SFP
MGX8950-EXTDR-CON	AXSM-XG Extender Connector for MGX 8950
OC12XG-CHANN-LIC	OC12/STM4 Channelization License (to OC3/STM1 and DS3)
OC12-XG-8950-LIC	OC-12 AXSM-XG on MGX 8950 License
CAB-SMF-LC	SM Fiber Cable, IR or LR, with LC connector
CAB-SMF-LC-Y	Single Mode Fiber Y-Cable, LC connector, IR or LR
ADPT-LC/SC-SM+MM=	LC-To-SC Adapter Cable, SM and MM
MGX-8850-APS-CON	APS connector for PXM1E, SRME and AXSM product family
MGX-APS-CON-8950	APS connector for MGX 8950

Note: An MGX8950-EXTDR-CON is required with each AXSM-8-622-XG when this front card is configured on the Cisco MGX 8950.

For More Information

For more information about Cisco service and support programs and benefits, go to: <http://www.cisco.com/>.



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