

## Cisco MGX 8800/8900 Series 16-Port OC-3c/STM-1 ATM Switch Service Module

### Product Overview

The Cisco MGX<sup>®</sup> 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<sup>®</sup> MGX 8800/8900 Series includes the Cisco MGX 8830/B, MGX 8850, MGX 8850/B, and MGX 8950 Multiservice Switches.

The Cisco 16-Port OC-3c/STM-1 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 Series 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 16 physical 155-Mbps interfaces that can be used to deliver high-density OC-3c or STM-1 trunking and User-Network Interface (UNI).

Up to 12 Cisco 16-port OC-3c/STM-1 ATM Switch Service Modules can reside in the Cisco MGX 8850, MGX 8850/B, or MGX 8950 to provide support for up to 192 OC-3c/STM-1 interfaces for service providers that require both high bandwidth and high network availability.

The Cisco 16-Port OC-3c/STM-1 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 Series 16-Port OC-3c/STM-1 ATM Switch Service Module



## Key Features

The main features of the Cisco MGX 8800/8900 16-Port OC-3c/STM-1 ATM Switch Service Module are listed here.

- Full nonblocking, full-duplex line-rate throughput on all 16 ports
- High reliability with hot-standby 1+1 16-port ATM switch service module card redundancy
- Per-virtual-path and per-virtual-circuit traffic shaping and available bit rate (ABR) with virtual source and virtual destination
- Y-cable and 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 16-Port OC-3c/STM-1 ATM Switch Service Module.

**Table 1.** Product Specifications

Description	Specification
<b>Chassis Compatibility</b>	Cisco MGX 8830/B, MGX 8850, MGX 8850/B, and MGX 8950
<b>Software Compatibility</b>	Cisco MGX 8800/8900 SW Release 5.0.20 and above
<b>Protocols</b>	ATM and SONET/SDH
<b>Port Density</b>	16 ports
<b>Layer 1 (Physical Layer) Feature Summary</b>	<ul style="list-style-type: none"> <li>• Support for ports and trunks on the same Cisco 155-Mbps 16-port ATM switch service module</li> <li>• UNI 3.0, 3.1, and 4.0 physical layer specifications</li> <li>• Compliance with the following SONET standards:               <ul style="list-style-type: none"> <li>◦ Bellcore GR-253-CORE</li> <li>◦ ANSI T1.105</li> </ul> </li> <li>• Compliance with the following SDH standards:               <ul style="list-style-type: none"> <li>◦ ITU-T G.707, G.708, G.709, and G.783</li> <li>◦ ITU-T G.957 and G.958</li> </ul> </li> </ul>

Description	Specification			
<b>Layer 1 (Physical Layer) Feature Summary (continued)</b>	<b>Additional Physical Layer Specifications for Ports and Optics</b>			
	<b>Connection Options</b>	<b>MMF<sup>1</sup></b>	<b>SMF-IR<sup>2</sup></b>	<b>SMF-LR<sup>3</sup></b>
	Port speed	155 Mbps	155 Mbps	155 Mbps
	Number of ports per Cisco MGX 8800/8900 Series 16-Port OC-3c/STM-1 ATM Switch Service Module	16	16	16
	Port media	MMF	SMF	SMF
	Port connector	LC	LC	LC
	Optics (nanometers- [nm])	Laser 1310 nm	Laser 1310 nm	Laser 1310 nm
	Transmit power level (decibels per milliwatt [dBm])	-15 minimum and -8 maximum	-15 minimum and -8 maximum	-5 minimum and -0 maximum
	Receive power level (dBm)	-23 minimum and -8 maximum	-28 minimum and -8 maximum	-34 minimum and -8 maximum
	Typical reach	200 meters [218 yards] with 62.5 micrometer core) and 500 meters [545 yards] with 50 micrometer core	15 km [9.3 mi]	40 km [24.85 mi]
	Redundancy	1+1 and 1:1 APS line	1+1 and 1:1 APS line	1+1 and 1:1 APS line
	<sup>1</sup> Multimode fiber <sup>2</sup> Single-mode fiber, short reach <sup>3</sup> Single-mode fiber, long reach			
<b>Layer 2 (ATM) Feature Summary</b>	<ul style="list-style-type: none"> <li>Configurable for trunk, Network-to-Network Interface (NNI), or UNI application</li> <li>Conformant to ATM Forum UNI 3.0, 3.1, and 4.0 and ITU-T I.361 and I.432 specifications</li> <li>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</li> <li>Supports Integrated Local Management Interface (ILMI) 4.0</li> <li>Complies with standard usage parameter control (UPC) as specified by ATM Forum UNI 3.0 and 4.0, TM 4.1, and ITU-T I.371</li> <li>Supports early packet discard (EPD), Weighted Random Early Detection (WRED), and partial packet discard (PPD)</li> <li>Supports virtual circuit connections (VCCs) and virtual path connections (VPCs)</li> <li>Supports up to 128,000 connections per 16-port ATM switch service module controlled by PNNI</li> <li>Supports virtual path identifier (VPI) and virtual circuit identifier (VCI) range for VCCs and VPCs per UNI 3.1</li> <li>Supports virtual circuit merge, per-virtual-circuit and per-virtual-path shaping, and multipoint connections</li> </ul> <p>Virtual trunks</p> <ul style="list-style-type: none"> <li>Supports a maximum of 128 virtual interfaces per module; the interfaces can be ports, trunks, or virtual trunks, and each virtual interface supports 16 CoS queues</li> </ul> <p>Cell buffering</p> <ul style="list-style-type: none"> <li>Supports 4 million cells of buffering to accommodate large traffic bursts and avoid network congestion and cell discard; suitable for TCP/IP traffic</li> </ul> <p>Support for dynamic routing using PNNI 1.0</p> <ul style="list-style-type: none"> <li>Offers an automatic end-to-end connection management mechanism</li> <li>Deterministically allocates bandwidth and reroutes connections autonomously over optimum network paths</li> <li>Preserves service integrity during network failure</li> <li>Offers E.164 and network-service-access-point (NSAP) addressing</li> <li>Offers support for SVC and SVP and for SPVC and SPVP</li> <li>Offers quality-of-service (QoS) based routing</li> </ul> <p>Enhanced call admission control</p> <ul style="list-style-type: none"> <li>A user-programmable Enhanced Call Admission Control (E-CAC) feature determines whether to admit or deny connections based on the requested QoS.</li> </ul>			

Description	Specification
<b>Layer 2 (ATM) Feature Summary (continued)</b>	<p>Statistics</p> <ul style="list-style-type: none"> <li>Statistics supported per connection</li> <li>Diagnostic statistics available per interface and CoS queues</li> </ul> <p>Operation, administration, and management</p> <ul style="list-style-type: none"> <li>F4 to F5 fault propagation</li> <li>In-band diagnostics support using loopback cells</li> <li>In-band continuity check and automatic fault reporting for PVCs</li> <li>Loopback facility support for diagnostics and self-test purposes</li> </ul>
<b>Network Management</b>	<ul style="list-style-type: none"> <li>Managed by Cisco WAN Manager software suite</li> <li>Based on Simple Network Management Protocol (SNMP)</li> </ul>
<b>Power</b>	<ul style="list-style-type: none"> <li>Input power required: -48 VDC</li> <li>Power consumption: 114W</li> </ul>
<b>Physical Dimensions</b>	H x D: 15.83 x 15.65 in. (40.20 x 39.75 cm)
<b>Weight</b>	6.5 lb (2.95 kg)
<b>Environmental Conditions</b>	<ul style="list-style-type: none"> <li>Storage temperature: -40 to 158F (-40 to 70°C)</li> <li>Operating temperature: <ul style="list-style-type: none"> <li>Normal: 41 to 104F (5 to 40°C)</li> <li>Short term: 23 to 122F (-5 to 50°C)</li> </ul> </li> <li>Relative humidity: <ul style="list-style-type: none"> <li>Normal: 5 to 85%</li> <li>Short term: 5 to 90% but not to exceed 0.024 kg (0.048 lb) of water per kg (lb) of dry air</li> </ul> </li> </ul> <p>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</p>

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

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"> <li>• SR-3580: NEBS Criteria Levels (Level 3)</li> <li>• GR-1089-CORE: NEBS EMC and Safety</li> <li>• GR-63-CORE: NEBS Physical Protection</li> </ul>
Telcordia CLEI	<ul style="list-style-type: none"> <li>• GR-485-CORE: CLEI coding</li> <li>• GR-383-CORE: CLEI code product label</li> <li>• GR-209-CORE: PCN process</li> </ul>

## Ordering Information

Table 3 lists ordering information for the Cisco MGX 8800/8900 Series 16-Port OC-3c/STM-1 ATM Switch Service Module.

**Table 3.** Ordering Information

Part Number	Product Name
AXSM-16-155-XG	Double-height ATM VS/VD service module, 16 OC-3c/STM-1
SFP-8-155	8-port SFP back card for OC-3/STM-1
MMF-1-155-SFP	Multi Mode Fiber FRU
SMFIR-1-155-SFP	Single Mode Fiber FRU, Intermediate Range
SMFLR-1-155-SFP	Single Mode Fiber FRU, Long Range
MGX8950-EXTDR-CON	AXSM-XG Extender Connector for MGX 8950
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-16-155-XG when this front card is configured on the Cisco MGX 8950.

## For More Information

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**Americas Headquarters**  
Cisco Systems, Inc.  
170 West Tasman Drive  
San Jose, CA 95134-1706  
USA  
www.cisco.com  
Tel: 408 526-4000  
800 553-NETS (6387)  
Fax: 408 527-0883

**Asia Pacific Headquarters**  
Cisco Systems, Inc.  
168 Robinson Road  
#28-01 Capital Tower  
Singapore 068912  
www.cisco.com  
Tel: +65 6317 7777  
Fax: +65 6317 7799

**Europe Headquarters**  
Cisco Systems International BV  
Haarlerbergpark  
Haarlerbergweg 13-19  
1101 CH Amsterdam  
The Netherlands  
www-europe.cisco.com  
Tel: +31 0 800 020 0791  
Fax: +31 0 20 357 1100

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