Cisco 1-Port Channelized OC-48/STM-16 Shared Port Adapter

The Cisco® I-Flex design combines shared port adapters (SPAs) and SPA interface processors (SIPs) using an extensible design that enables service prioritization for voice, video, and data services. Enterprise and service provider customers can use the improved slot economics resulting from modular port adapters that are interchangeable across Cisco routing platforms. The I-Flex design maximizes connectivity options and offers superior service intelligence through programmable interface processors that deliver line-rate performance. I-Flex enhances speed-to-service revenue and provides a rich set of quality-of-service (QoS) features for premium service delivery while effectively reducing the overall cost of ownership. This data sheet contains the specifications for the Cisco 1-Port Channelized OC48/STM-16 SPA (refer to Figure 1).

Figure 1. Cisco 1-Port Channelized OC48/STM-16 Shared Port Adapter

Product Overview

The Cisco 1-Port Channelized OC-48/STM-16 SPA is available on high-end Cisco routing platforms offering the benefits of network scalability with lower initial costs and ease of upgrades. The Cisco SPA/SIP portfolio continues the Cisco focus on investment protection along with consistent feature support, broad interface availability, and the latest technology. The Cisco SPA/SIP portfolio allows different interfaces (Packet over SONET/SDH [POS], ATM, Ethernet, etc.) to be deployed on the same interface processor.

Applications

Internet traffic continues to grow at an explosive rate – with the number of users doubling each year. This unsurpassed growth is increasing the demand for higher-capacity interfaces from OC-3/STM-1 to OC-48/STM-16. In addition, POS enables efficient transport of IP traffic and uses SONET/SDH concatenated payloads (that is, STS-3c/VC-4, STS-12c/VC-4-4c, or STS-48c/VC-4-16c) to achieve a higher order of statistical multiplexing.

Service providers face the challenge of meeting customer demand by building scalable, feature-rich edge networks that can deliver value-added services such as Multiprotocol Label Switching VPNs (MPLS VPNs); voice, video, and data integration; and tiered service offerings at all interface rates without compromising density or line-rate performance. The Cisco Channelized OC-48/STM-16 SPA channels one OC-48 or STM-16 interface into DS-3, E3, OC-3c, STM-1c, OC-12c, or STM-4c channels and provides an extensive set of service-enabling edge features while performing at line rate simultaneously on all ports.

Features at a Glance

- 1-port Channelized OC-48/STM-16 per SPA

- SONET PDH-DS3 (M23 and C-bit) mapping: STS-1<>DS3

- Channelization support for 4 OC-12, 16 OC-3, 48 DS-3 channels, or any combination of these

- Subrate DS-3

- Bit Error Rate Test (BERT) support for T3/E3 channels

- MDL for T3/E3 channels

Channelization support:

- AU-3<---->VC-3<--->DS3 or AU-4<---->TUG-3<---->VC-3<--->DS3

- AU-3<--->VC-3<---->E3 or AU-4<--->TUG-3<----->VC-3<---->E3

Product Specifications

Table 1 describes the basic features on the Channelized OC48/STM-16 SPA.

Table 1.   Product Features

Features	Descriptions
Product compatibility	Cisco XR 12000 Series Routers Cisco ASR 9000 Series Router
Port density per SPA	1-port Channelized OC-48/STM-16

Physical interface (Channelized OC-48)	OC-48c/STM-16 Small Form-Factor Pluggable (SFP) optics module (refer to optical parameters in Table 2)
	Visual status indicators (LEDs):
	• SPA status LED
	• Per-port LEDs
	  ◦ Carrier and alarm
	  ◦ Active and loopback

Protocols	• IETF RFC 1490, Frame Relay Encapsulation • RFC 1662, Point-to-Point Protocol (PPP) in High-Level Data Link Control (HDLC)-like framing • Cisco HDLC • PPP, HDLC, and Frame Relay User Network Interface (UNI) encapsulations
Features and functions	DS3 • Full- and half-duplex connectivity at DS-3 rate (44.736 MHz) • Scrambling and subrate support of major data-service-unit (DSU) vendors • C-bit or M23 framing in DS-3 mode • G.751 or G.832 in E3 mode • Support for 16- and 32-bit cyclic redundancy check (CRC) (16-bit default) • 24-hour history maintained for error statistics and failure counts • DS-3 alarm and event detection (once-per-second polling) • Alarm indication signal (AIS) • Out of frame (OOF) • Far-end receive failure (FERF)

Features	Descriptions

SONET errors, alarms, and performance monitoring	Synchronization
	• Local (internal) or loop timed (recovered from network)
	• Pointer activity monitoring
	Local (diagnostic) and line (network) loopback
	Payload mapping
	• POS with $1 + X^{43}$ self-synchronous scrambler
	SONET/SDH compliance
	• Telcordia (Bellcore) GR-253-CORE (as applicable)
	• ANSI T1.105, T1.231
	• ITU-T G.707, G.957, G.825 (as applicable)
	Supported SONET/SDH alarm and signal events
	• Signal failure bit error rate (SF-ber)
	• Signal degrade bit error rate (SD-ber)
	• Signal label payload construction (C2)
	• Path trace byte (J1)
	• Section
	  ◦ Loss of signal (LoS)
	  ◦ Loss of frame (LoF)
	  ◦ Error counts for B1
	  ◦ Threshold crossing alarms (TCA) for B1
	• Line
	  ◦ Line alarm indication signal (LAIS)
	  ◦ Line remote defect indication (LRDI)
	  ◦ Line remote error indication (LREI)
	  ◦ Error counts for B2
	  ◦ TCA for B2
	• Path
	  ◦ Path alarm indication signal (PAIS)
	  ◦ Path remote defect indication (PRDI)
	  ◦ Path remote error indication (PREI)
	  ◦ Error counts for B3
	  ◦ TCA for B3
	  ◦ Loss of pointer (LoP)
	  ◦ Positive stuffing event (PSE)
	Negative stuffing event (NSE)
	Path unequipped indication signal (PUNEQ)
	Path payload mismatch indication signal (PPLM)

Network management	• SONET-MIB (RFC 3592) • SONET/SDH-MIB (RFC 2558) • CISCO-SONET-MIB • DS-3/E3-MIB (RFC 3896) • Simple Network Management Protocol (SNMP)
Reliability and availability	• Online insertion and removal (OIR) • Field-replaceable SFP optical modules • 1+1 SONET Automatic Protection Switching (APS) and SDH Linear Multiplexer Section Protection (MSP) protocols • Single SPA software reset
Physical specifications	• Weight: 1.27 lb (0.57 kg) • Height: 1.56 in. (3.96 cm) (double height) • Width: 6.75 in. (17.15 cm) • Depth: 7.28 in. (18.49 cm)
Power	• 1-port Channelized OC-48/STM-16 = 44W (with optics)
Environmental specifications	• Operating temperature: 41 to 104°F (5 to 40°C) • Storage temperature: −38 to 150°F (−40 to 70°C) • Operating humidity: 5 to 85% relative humidity • Storage humidity: 5 to 95% relative humidity

Features	Descriptions
Compliance and agency approvals	Safety • UL/CSA 60950-1 • IEC/EN 60950-1 • AS/NZS 60950.1 • EN60825/IEC60825 laser safety • 21CFR1040 -FDA Code of Federal Regulations (USA) laser safety EMC • FCC Part 15 (CFR 47) • ICES 003 • CISPR 22 • AS/NZS CISPR22 • VCCI • EN55022 • EN55024 • EN300 386 • EN50082-1 • EN61000-6-1 Network Equipment Building Standards (NEBS) This product is designed to meet the following requirements (official qualification may be in progress): • SR-3580 – NEBS: Criteria levels (Level 3 compliant) • GR-63-CORE – NEBS: Physical Protection • GR-1089-CORE – NEBS: EMC and Safety

Table 2 shows the hardware specifications for the Channelized OC-48/STM-16 SPA.

Table 2.   Optical Specifications for the Cisco 1-Port Channelized OC-48 SPA

SFP Optics	Maximum Distance
Single-mode (SM)	Up to 1.2 mi (2 km)
SM intermediate reach (IR-1)	Up to 9 mi (15 km)
SM extended reach (LR-2)	Up to 50 mi (80 km)

Power and Environmental Requirements

When installed in Cisco routers, these SPAs do not change the power or environmental requirements and standards of the router platform itself. Refer to the platform-specific data sheets for more information.

Ordering Information

To place an order, visit the Cisco Ordering Homepage and refer to Table 3.

Table 3.   Ordering Information

Product Name	Part Number
Cisco 1-port Channelized OC48/STM-16 SPA	SPA-1xCHOC48/DS3
OC48/STM-16, OC48/STM-16 SFP, SM, SR	SFP-OC48-SR
OC48/STM-16, OC48/STM-16 SFP, SM, IR-1	SFP-OC48-IR1
OC48/STM-16, OC48/STM-16 SFP, SM, LR-2	SFP-OC48-LR2

Service and Support

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For More Information

For more information about the Cisco SPA/SIP portfolio, visit www.cisco.com/go/spa or contact your local Cisco account representative.

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