Data Sheet

Cisco ONS 15454 OC-192/STM-64 XFP-Based Optics Card

The Cisco® ONS 15454 OC-192/STM-64 10-Gigabit Small Form-Factor Pluggable-Based (XFP-Based) Optics Card improves the system flexibility for the Cisco ONS 15454 Multiservice Provisioning Platform (MSPP) and lowers the cost of sparing 10-Gbps interfaces.

Product Overview

The Cisco ONS 15454 OC-192/STM-64 XFP-Based Optics Card provides a single XFP-based pluggable optics module. The multiple-rate optics card (Figure 1) operates in either Cisco ONS 15454 SONET or SDH systems, providing multiple-reach capabilities including short-reach/inter-office (SR/IO), intermediate-reach/short-haul (IR/SH), and long-reach/long-haul (LR/LH). Additionally, the SR/IO-only card provides a cost-effective, fixed SR/IO configuration to support first cost-sensitive installations where flexibility is not paramount.

Figure 1
Cisco ONS 15454 OC-192/STM-64 XFP-Based Optics Card

The OC-192/STM-64 XFP card can carry concatenated payloads of STS-3c/VC-4, STS-6c/VC-4-2c, STS-12c/VC-4-4c, STS-24c/VC-4-8c, and STS-48c/VC-4-16c, as well as nonconcatenated payloads on an STS-1, VC-4, VC-3, VC-12, VC-11, and VT1.5 basis. In SONET applications, the card is software-provisionable to transport SDH payloads over SONET in the form of STS-Nc-concatenated payloads. When operated within the outlined specifications (Table 4), each card will transport the 10-Gbps signal with a maximum bite error rate (BER) of 10E-12.

The card is deployable in the four high-speed interface card slots (5, 6, 12, and 13) of the Cisco ONS 15454 MSPP. The card's port can be commissioned for use in unidirectional-path switched ring/subnetwork connection protection (UPSR/SNCP), 2-fiber and 4-fiber bidirectional line switched ring/multiplex section-shared protection ring (BLSR/MS-SPR), 1+1 automatic protection switching/line multiplex section protection (APS/LMSP), or path-protected mesh network (PPMN) architectures, providing the flexibility to build the type of networks required to meet service demands, traffic patterns, and user needs. This card-provisioning flexibility also helps reduce the cost of inventory and simplifies engineering and deployment.

The OC-192/STM-64 XFP card supports in-service bandwidth upgrade capabilities from lower-speed cards including the single-port OC-12/STM-4, OC-48/STM-16, and OC-192/STM-64 cards, using the Cisco Transport Controller's simple span-upgrade wizard.

The OC-192/STM-64 XFP card incorporates faceplate-mounted LEDs to provide a quick visual check of the operational status at the card as well as the interface port. The LEDs will be exercised during a user-requested lamp test operation. The fan-tray-mounted liquid crystal display (LCD) and soft keys provide the technician local access to the port status of the optical port without the need to access the craft manager. Printed on the faceplate is a blue triangle icon, which indicates the shelf slot where the card can be physically installed.

The card is supported by the integrated Cisco Transport Controller craft manager for the Cisco ONS 15454 MSPP. The controller provides the user with access to operations, administration, maintenance, and provisioning (OAM&P) for the system. Access to inventory data for the installed OC-192/STM-64 XFP card and XFP are available through the craft manager, Cisco Transport Manager element management system, and through TL1 requests.

The XFP modules used with the OC-192/STM-64 XFP card are SONET/SDH-compliant optical interfaces. The transmitter and receiver reside on the same module and are interconnected to the fiber using small form-factor LC connectors. The XFP optics in the OC-192/STM-64 XFP card support a provisionable automatic laser shutdown feature (ITU G.664) to turn off the transmitting laser in the event of a fiber failure on the span. The XFP optical parameters, including laser bias current, optical transmit power, and optical receive power will be available through Cisco Transport Controller and TL1 to enable simplified troubleshooting and advanced warning of potential impending issues, using user-configurable high and low threshold crossing alerts (TCAs). The XFP cage is angled down relative to the faceplate to reduce bend-induced stresses on the optical fibers attached to the XFP.

Applications

A Cisco ONS 15454 MSPP equipped with the OC-192/STM-64 XFP cards provides application solutions for both service provider and enterprise customers, including the following:

Application Solution: High-Capacity Multiservice Transport Network—The OC-192/STM-64 XFP card provides the bandwidth to transport many high-speed services over a single pair of optical fibers (Figure 2).

Figure 2
High-Capacity Multiservice Transport over OC-192/STM-64
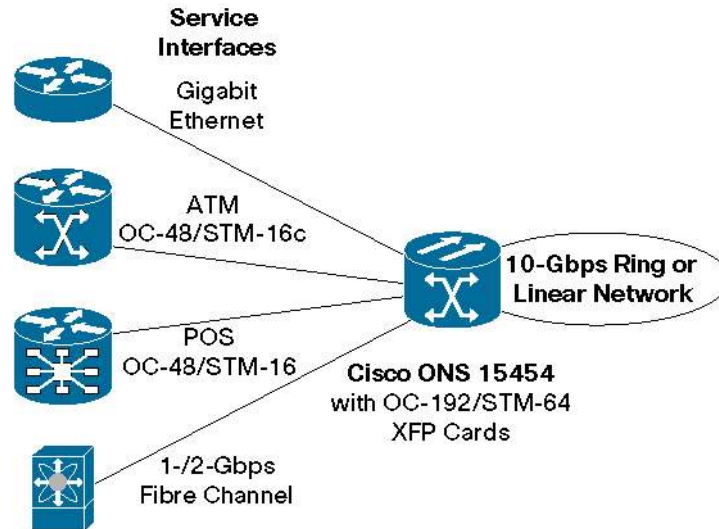
The Cisco ONS 15454 also supports lower-speed service interfaces as well, starting at 1.5 Mbps/2.0 Mbps (DS-1/E1), Ethernet, Fast Ethernet, and others to offer a complete multiservice transport solution.

Key Features and Benefits

Table 1 outlines some of the key features and benefits of the OC-192/STM-64 XFP card.

Table 1.   Features and Benefits

Feature	Benefits
XFP module-based	More cost-effective sparing of XFPs versus fixed card alternatives. Suitable for all metro applications between central offices, colocation offices, or enterprise and campus facilities with span lengths from 2 km to 80 km. Allows common carrier card to support many user applications through plug-in devices and simplifies support for system changes.
Full complement of performance management features including 15-minute and 24-hour statistics, SONET/SDH alarms and conditions, threshold crossing alerts (TCAs), loopbacks, J0 section/regenerator section trace, and J1 path trace	Enhances network maintenance and troubleshooting activities.
SDH tunneling over SONET support	Allows transport for SDH terminal equipment over installed optical network.
User-defined automatic in-service (AINS) of ports	Allows service port and path to be created awaiting valid signal without creating invalid system alarms.
Telcordia Technologies OSMINE	Support for Telcordia TIRKS for both card and XFP optics in card.

Summary/Conclusion

The Cisco ONS 15454 OC-192/STM-64 XFP-Based Optics Card adds significant value to user networks by enhancing system flexibility and lowering operational costs.

Regulatory Compliance

Table 2 outlines the regulatory compliance specifications that are met by the OC-192/STM-64 XFP card.

Table 2. Regulatory Compliance

Regulatory Compliance	
Homologation	
SONET/ANSI System	**SDH/ETSI Systems**
Canada	Australia
European Union (EU)	China
Japan	EU
Korea	Hong Kong
Mexico	Korea
United States	Mexico
	New Zealand
	Singapore
Electromagnetic Compliance	
ETSI 300-386-TC	
NEBS Telcordia Technologies GR-1089-CORE, Issue 3 (Level 3, Type 2 and Type 4)	
IEC CISPR 22, CISPR 24	
ICES-003, Issue 3, 1997	
FCC 47CFR15	
EU EN55024, EN55022	
EN6100-6-1	
Resolution 237 (Brazil)	
VCCI:V-3/2000.04 (Japan)	
Product Safety	
CSA CAN/CSA-C22.2 No. 950-95, 3rd Edition	
NEBS Telcordia Technologies GR-1089-CORE, Issue 3, (Level 3, Type 2 and Type 4)	
IEC 60950-1 / EN 60950-1, 1st edition	
UL and cUL / CSA 60950-1, 1st edition	
Laser Safety	
UL / CSA 60950-1 or IEC 60950-1 / EN60950-1	
21CFR1040	
EN or IEC 60825-1	
EN or IEC 60825-2	
Environmental	
NEBS Telcordia Technologies GR-63-CORE, Level 3	
ETS 300 019-2-1 (Storage, Class 1.1)	
ETS 300 019-2-2 (Transportation, Class 2.3)	
ETS 300 019-2-3 (Operational, Class 3.1E)	

Regulatory Compliance	
Telecom	
Telcordia Technologies GR-253-CORE (OC-192)	
European Union G.707, G.825, G.957	
Japan JATE Technical Requirements (Green Book)	
Other	
AT&T Network Equipment Development Standards (NEDS) Generic Requirements	
SBC TP76200MP	
Verizon TCG Checklist	
MCI ESD	

Product Specifications

Table 3 outlines the OC-192/STM-64 XFP product specifications. Table 4 outlines the optical specifications for the XFP modules.

Table 3. Product Specifications

Parameter	Value
XFP Capacity	1 module
Supported Payloads	
SONET	VT-1.5, VT-2, STS-1, and STS-Nc; where N = 3, 6, 9, 12, 18, 24, 36, 48, 192
SDH	VC-11, VC-12, VC-3, VC-4, and VC-4-Nc; where N = 2, 3, 4, 8, 16, 64
Management	
Card LEDs	
Failure (FAIL)	Red
Active/standby (ACT/STBY)	Green/Amber
Signal fail (SF)	Yellow
Port LEDs	
Operational state (bi-color)	
Operational, ready to carry traffic	Green
Line condition present	Red
Power	
Card Power Draw, Maximum (with XFP)	40W
Operating Environment	
Temperature	
Standard (with CWDM and DWDM XFP optics)	−23 to 131°F (−5 to 55°C)
Humidity	5 to 95% noncondensing
Storage Environment	
Temperature	−40 to 185°F (−40 to 85°C)
Humidity	5 to 95% noncondensing
Physical Dimensions	
Size	1 card slot
Weight (Including XFP)	1.78 lbs. (without XFP) 0.81 kg

Table 4. XFP Optical Specifications

XFP Type (Part Number)	Attenuation Range (dB)	Transmit Output Power, Minimum (dBm)	Transmit Output Power, Maximum (dBm)	Receiver Sensitivity, Minimum[1] (dBm)	Receiver Sensitivity, Maximum (dBm)	Dispersion Tolerance (ps/nm)	Optical Power Penalty, Maximum (dB)
OC-192/STM-64 SR/I64 (ONS-XC-10G-S1)	0–4	–6	–1	–11	–1	6.6	1
OC-192/STM-64 IR-2/S64.2b (ONS-XC-10G-I2)	3–11	–1	2	–14	2	800	2
OC-192/STM-64 LR2/P1L1-2D2[2] (ONS-XC-10G-L2)	11–22	0	4	–24	–7	1600	2

1. Bit Error Rate = 1x10-12

2. ITU-T G.959.1 long-haul specification

System Requirements

Table 5 outlines the minimum requirements to operate the OC-192/STM-64 XFP card.

Table 5. System Requirements

Parameter	Cisco ONS 15454 SONET/ANSI System	Cisco ONS 15454 SDH/ETSI System
Shelf assembly	SA-HD, SA-ANSI	SA-ETSI
Timing, communications, and control card	TCC2 or TCC2P	TCC2 or TCC2P
Cross-connect card	XC-VXC-10G, XC-10G	XC-VXC-10G, XC-VXL-10G
Cisco ONS 15454 system software	Release 6.0 or greater	Release 6.0 or greater
Slot compatibility	Slots 5, 6, 12, 13	Slots 5, 6, 12, 13

Ordering Information

To place an order, visit the Cisco Ordering Home Page. Table 6 outlines the orderable part numbers for the OC-192/STM-64 XFP card. Table 7 outlines the orderable part numbers for the XFP modules that are qualified for the OC-192/STM-64 XFP card.

Table 6. Ordering Information

Product Name	Part Number
OC-192 XFP-based multiple-reach optics card, 1 ckt., SONET systems	15454-10G-XR
STM-64 XFP-based multiple-reach optics card, 1 ckt., SDH systems	15454E-10G-XR
OC-192 XFP-based optics card, supports short-reach only, XFP included, SONET systems	15454-10G-S1
STM-64 XFP-based optics card, supports intra-office reach only, XFP included, SDH systems	15454E-10G-I1

Table 7. Ordering Information: XFP Modules

Product Name	Part Number
XFP, OC-192/STM-64, short-reach/intra-office, 1310 nm, SMF	ONS-XC-10G-S1
XFP, OC-192/STM-64, intermediate-reach/short-haul, 1550 nm, SMF	ONS-XC-10G-I2
XFP, OC-192/STM-64, long-reach/long-haul, 1550 nm, SMF	ONS-XC-10G-L2

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For More Information

For more information about the Cisco ONS 15454 Multiservice Provisioning Platform, visit http://cisco.com/en/US/products/hw/optical/ps2006/index.html or contact your local account representative or Cisco partner.

CISCO SYSTEMS

Corporate 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: 408 526-4100

European Headquarters
Cisco Systems International BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: 31 0 20 357 1000
Fax: 31 0 20 357 1100

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
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

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