



# Installing the OPT-BST-L Card in the Cisco ONS 15454 SONET/SDH

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**Product Names: 15454-OPT-BST-L**

This document provides a card description, specifications, and installation procedure for the dense wavelength division multiplexer (DWDM) OPT-BST-L card. The OPT-BST-L card is compatible with the ONS 15454 SONET (ANSI) and the Cisco ONS 15454 SDH (ETSI) shelf assemblies. Use this document in conjunction with the *Cisco ONS 15454 DWDM Procedure Guide*.

This document contains the following sections:

- [OPT-BST-L Card Description, page 1](#)
- [OPT-BST-L Card Specifications, page 5](#)
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## OPT-BST-L Card Description

The OPT-BST-L standard gain range is 8 to 20 dB in the controllable gain tilt mode, and 20 to 27 dB in the uncontrolled gain tilt mode. The OPT-BST-L is designed to support 64 channels at 50-GHz channel spacing, but is currently limited to 32 channels at 100 GHz spacing. The OPT-BST-L is an L-band DWDM erbium-doped fiber amplifier (EDFA) with optical service channel (OSC) add-and-drop capability. The card is well suited for use in networks that employ dispersion shifted (DS) fiber or SMF-28 single-mode fiber. When an ONS 15454 has an OPT-BST-L installed, it is only necessary to have the OSCM to process the OSC. You can install the OPT-BST-L in Slots 1 to 6 and 12 to 17. To control the gain tilt, the OPT-BST-L is equipped with a built-in VOA.



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The OPT-BST-L features include:

- Fixed gain mode (with programmable tilt)
- True variable gain
- Fast transient suppression
- Nondistorting low-frequency transfer function
- Settable maximum output power
- Fixed output power mode (mode used during provisioning)
- ASE compensation in fixed gain mode
- Full monitoring and alarm handling with settable thresholds
- OSRI, which is a software feature capable (through CTC) of shutting down the optical output power or reducing the power to a safe level (automatic power reduction)
- Automatic laser shutdown (ALS), a safety mechanism used in the event of a fiber cut. For details on ALS provisioning for the card, see the *Cisco ONS 15454 DWDM Procedure Guide*. For information on using the card to implement ALS in a network, refer to the *Cisco NS 15454 DWDM Reference Manual*.

**Note**

The optical splitters each have a ratio of 1:99. The result is that the power at the MON TX and MON RX ports is about 20 dB lower than the power at the COM TX and COM RX ports.

[Figure 1](#) shows the faceplate and the block diagram for OPT-BST-L. [Figure 2](#) shows optical module functional diagram of the OPT-BST-L card.

**Figure 1** OPT-BST-L Faceplate and Block Diagram

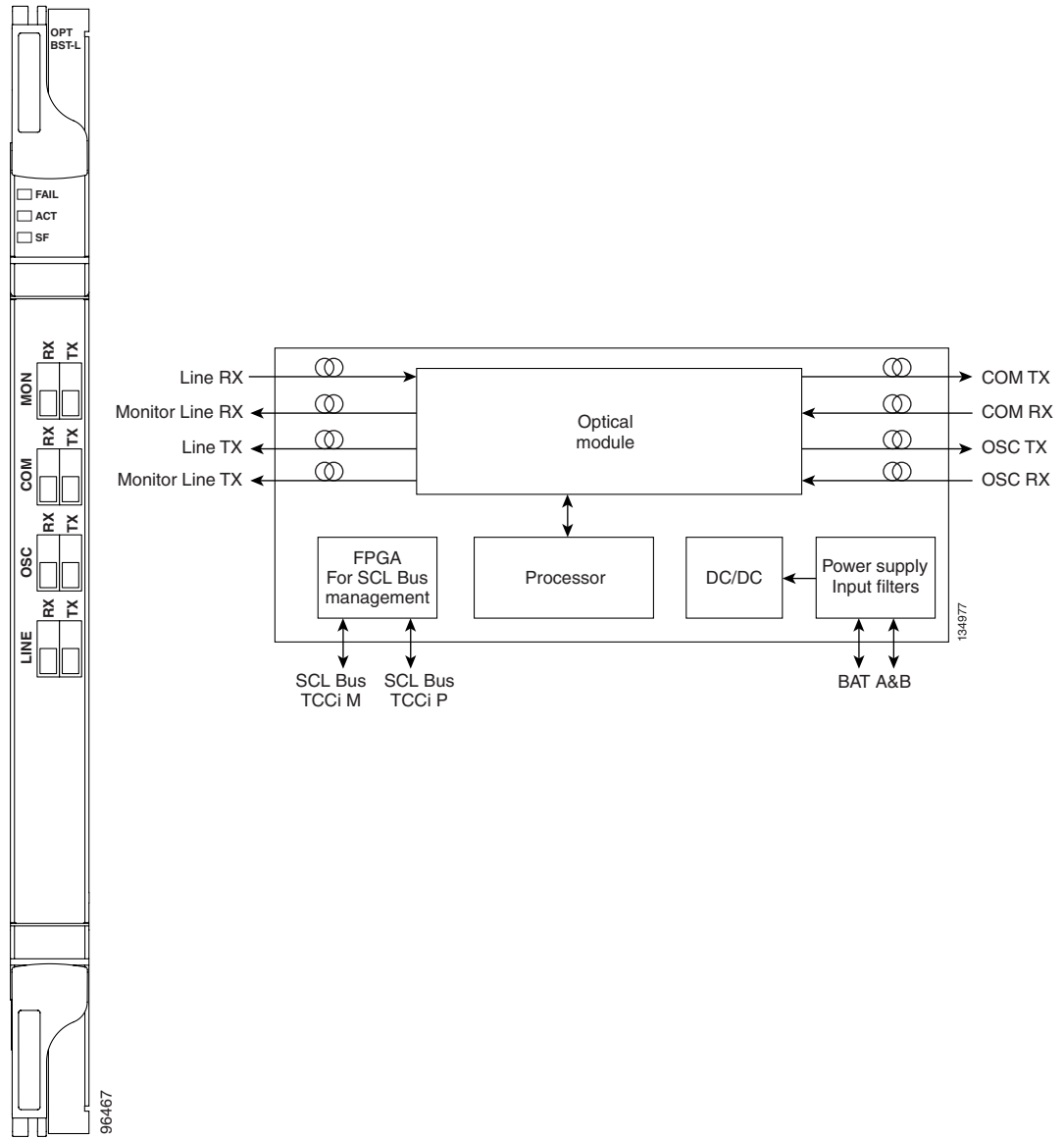
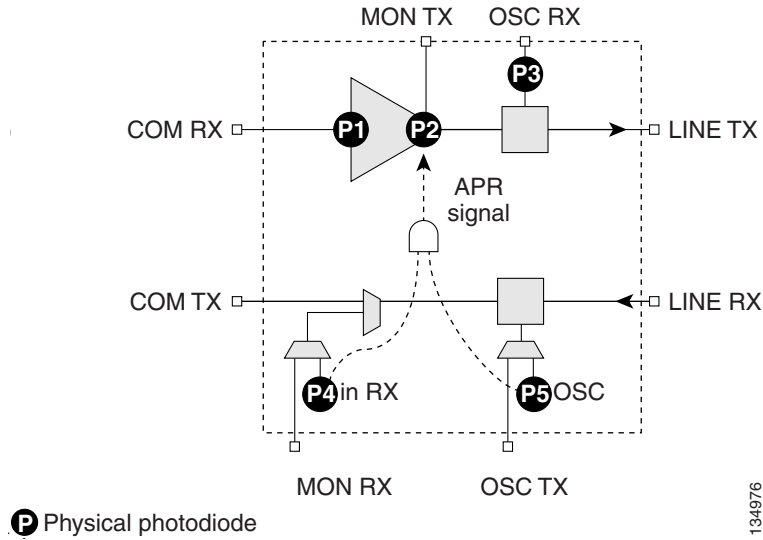


Figure 2 OPT-BST Optical Module Functional Diagram



## Power Monitoring

Physical photodiodes P1, P2, P3, P4, and P5 monitor the power for the OPT-BST-L card. The returned power level values are calibrated to the ports as shown in [Table 1](#).

Table 1 OPT-BST-L Port Calibration

Photodiode	CTC Type Name	Calibrated to Port
P1	Input COM	COM RX
P2	Output Line (Total Output)	LINE TX
	Output Line (Signal Output)	
P3	Output OSC-RX	OSC-RX
P4	Output COM	LINE RX
P5	Output OSC-TX	

## Card Level Indicators

The OPT-BST-L card has three card-level LED indicators described in [Table 2](#).

**Table 2**      **OPT-BST-L Card-Level Indicators**

<b>Card-Level Indicators</b>	<b>Description</b>
Red FAIL LED	The red FAIL LED indicates that the card's processor is not ready or that there is an internal hardware failure. Replace the card if the red FAIL LED persists.
Green ACT LED	The green ACT LED indicates that the OPT-BST-L is carrying traffic or is traffic-ready.
Amber SF LED	The amber SF LED indicates a signal failure or condition such as LOS on one or more of the card's ports. The amber SF LED also illuminates when the transmit and receive fibers are incorrectly connected. When the fibers are properly connected, the light turns off.

## Port-Level Indicators

You can find the status of the card ports using the LCD screen on the ONS 15454 ANSI fan-tray assembly. Use the LCD to view the status of any port or card slot; the screen displays the number and severity of alarms for a given port or slot.

The OPT-BST-L amplifier has eight optical ports located on the faceplate:

- MON RX is the output monitor port (receive section).
- MON TX is the output monitor port.
- COM RX is the input signal port.
- LINE TX is the output signal port.
- LINE RX is the input signal port (receive section).
- COM TX is the output signal port (receive section).
- OSC RX is the OSC add input port.
- OSC TX is the OSC drop output port.

## OPT-BST-L Card Specifications

The OPT-BST-L amplifier card has the following specifications:

- Optical characteristics:
  - Total operating wavelength range: 1570.0 to 1605.0 nm
  - Gain ripple (peak to valley): 1.5 dB
  - Gain range: 8 to 20 dB with programmable gain tilt
  - Extended gain range: 20 to 27 dB with gain tilt uncontrolled
  - Gain and power regulation over/undershoot: 0.5 dB
  - Limited maximum output power: 10 dBm
  - Maximum output power (with full channel load): 17 dB
  - Minimum output power (with one channel): -10 dBm

- Input power (Pin) range at full channel load: -10 to 9 dBm
- Input power (Pin) range at single channel load: -37 to -18 dBm
- Noise figure at  $G^3$  20 dB = 7.5 dB
- Insertion Loss (Line RX to OSC TX): 0.3 to 1.8 dB
- Insertion Loss (Line RX to COM TX): 0.3 to 1.0 dB
- Insertion Loss (OSC RX to LINE TX): 0.3 to 1.3 dB
- Optical connectors: LC-UPC/2
- Environmental
  - Operating temperature:
    - C-Temp: -5 to +55 degrees Celsius (+23 to +131 degrees Fahrenheit)
  - Operating humidity: 5 to 85 percent, noncondensing
- Dimensions
  - Height: 12.65 in. (332 mm)
  - Width: 0.92 in. (24 mm)
  - Depth: 9.00 in. (240 mm)

## Install the OPT-BST-L Card



**Warning**

**During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.** Statement 94



**Warning**

**Class I (CDRH) and Class 1M (IEC) laser products.** Statement 1055



**Warning**

**Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments.** Statement 272



**Caution**

Do not install the DWDM cards until you are directed to do so during DWDM node turnup.



**Note**

If protective clips are installed on the card connectors, remove the clips before installing the cards.



**Note**

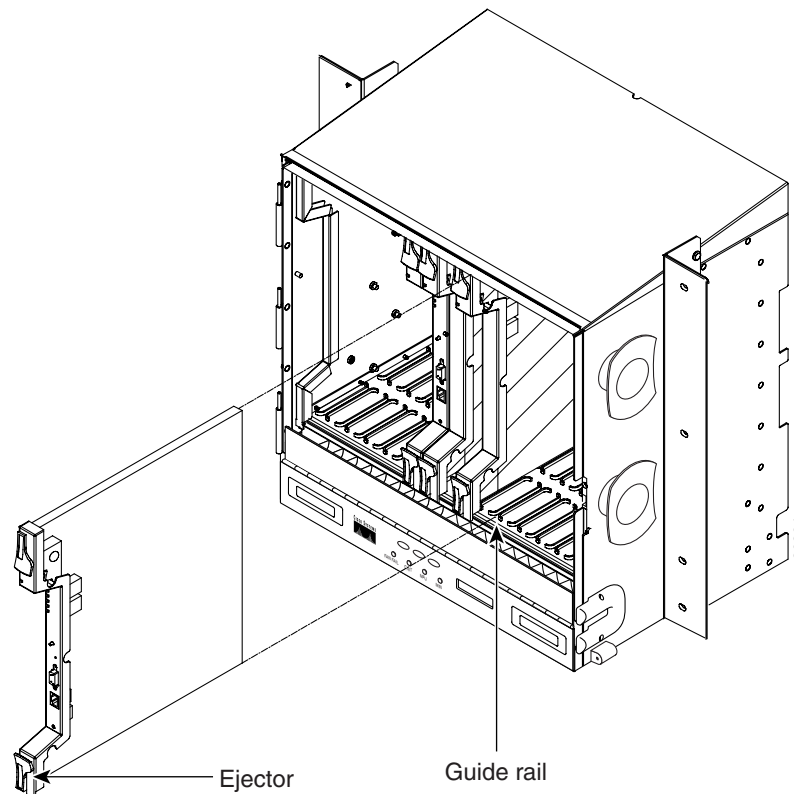
If you install a card incorrectly, the FAIL LED flashes continuously.

**Note**

The automatic node setup (ANS) feature in the node begins to determine what kind of site you are installing as soon as you install cards. Automatic power control (APC) is enabled after ANS initializes and after a channel has been provisioned. To provision a DWDM channel, see the *Cisco ONS 15454 DWDM Procedure Guide*. For more information about amplifier power control, see the *Cisco ONS 15454 DWDM Reference Manual*.

Figure 3 shows general card installation.

**Figure 3** Installing a Card in the Cisco ONS 15454 SONET (ANSI) Shelf Assembly



Install OPT-BST-L card in any open east and west pair of slots.

**Step 1**

Plan your node installation or consult the site plan. As soon as you begin installing cards, ANS determines what kind of site to set up based on the following parameters:

- Hub site—Two 32DMX-O and two 32MUX-O cards are provisioned but no AD-xC or AD-xB cards are provisioned
- Terminal—One 32DMX-O and one 32MUX-O card are provisioned, and no AD-xC or AD-xB cards are provisioned
- Line site—Only one OPT-PRE, OPT-BST or OPT-BST-L is provisioned per line direction. (Up to two OPT-PRE, two OPT-BST-L, and two OPT-AMP-L cards can be provisioned in the same shelf.)
- OADM site—At least 1 AD-xC or AD-xB is provisioned and no 32DMX-O or 32MUX-O cards are provisioned
- Unknown—Provisioned cards do not follow any of the previously listed categories.

- Step 2** Open the card latches/ejectors.
- Step 3** Use the latches/ejectors to firmly slide the OPT-BST-L card along the guide rails until the card plugs into the receptacle at the back of the slot.
- Step 4** Install the card in any open east and west pair of slots. OPT-BST-L cards are often installed in Slots 1 to 6 and 12 to 17.
- Step 5** Verify that the card is inserted correctly and close the latches/ejectors on the card.

**Note**


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It is possible to close the latches/ejectors when the card is not completely plugged into the chassis. Ensure that you cannot insert the card any further.

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The following LED activity will occur:

- The FAIL LED turns on for approximately 35 seconds. During this time, the ACT LED will cycle through various states, and then extinguish.
- The FAIL LED blinks for approximately 40 seconds.
- All LEDs turn on and then turn off within 5 seconds.
- If new software is being downloaded to the card, the ACT and SF LEDs blink from 20 seconds to 5 minutes, depending on the card type.
- The ACT LED turns on.

- Step 6** The signal fail (SF) LED might persist until all card ports connect to their far-end counterparts and a signal is present. If the card does not boot up properly, or the LED activity does not mimic [Step 5](#) check the following:
- When a physical card type does not match the type of card provisioned for that slot in CTC, the card might not boot. If a DWDM card does not boot, open CTC and ensure that the slot is not provisioned for a different card type before assuming the card is faulty.
  - If the red FAIL LED does not turn on, check the power.
  - If you insert a card into a slot provisioned for a different card, all LEDs turn off.
  - If the red FAIL LED is on continuously or the LEDs behave erratically, the card is not installed properly. Remove the card and repeat steps [2](#) to [5](#).

**Note**


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Refer to the *Cisco ONS 15454 DWDM Procedure Guide* for fibering and provisioning instructions.

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## Related Documentation

- *Cisco ONS 15454 DWDM Reference Manual*
- *Cisco ONS 15454 DWDM Procedure Guide*
- *Cisco ONS 15454 DWDM Troubleshooting Guide*
- *Cisco MetroPlanner DWDM Operations Guide*

# Obtaining Documentation

Cisco documentation and additional literature are available on Cisco.com. Cisco also provides several ways to obtain technical assistance and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

## Cisco.com

You can access the most current Cisco documentation at this URL:

<http://www.cisco.com/techsupport>

You can access the Cisco website at this URL:

<http://www.cisco.com>

You can access international Cisco websites at this URL:

[http://www.cisco.com/public/countries\\_languages.shtml](http://www.cisco.com/public/countries_languages.shtml)

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The Product Documentation DVD is a comprehensive library of technical product documentation on portable media. The DVD enables you to access multiple versions of hardware and software installation, configuration, and command guides for Cisco products and to view technical documentation in HTML. With the DVD, you have access to the same documentation that is found on the Cisco website without being connected to the Internet. Certain products also have .pdf versions of the documentation available.

The Product Documentation DVD is available as a single unit or as a subscription. Registered Cisco.com users (Cisco direct customers) can order a Product Documentation DVD (product number DOC-DOCDVD=) from Cisco Marketplace at this URL:

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Optical networking-related documentation, including Cisco ONS 15xxx product documentation, is available in a CD-ROM package that ships with your product. The Optical Networking Product Documentation CD-ROM is updated periodically and may be more current than printed documentation.

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From this site, you can perform these tasks:

- Report security vulnerabilities in Cisco products.
- Obtain assistance with security incidents that involve Cisco products.
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A current list of security advisories and notices for Cisco products is available at this URL:

<http://www.cisco.com/go/psirt>

If you prefer to see advisories and notices as they are updated in real time, you can access a Product Security Incident Response Team Really Simple Syndication (PSIRT RSS) feed from this URL:

[http://www.cisco.com/en/US/products/products\\_psirt\\_rss\\_feed.html](http://www.cisco.com/en/US/products/products_psirt_rss_feed.html)

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An emergency is either a condition in which a system is under active attack or a condition for which a severe and urgent security vulnerability should be reported. All other conditions are considered nonemergencies.

- Nonemergencies — [psirt@cisco.com](mailto:psirt@cisco.com)

In an emergency, you can also reach PSIRT by telephone:

- 1 877 228-7302
- 1 408 525-6532



**Tip**

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We encourage you to use Pretty Good Privacy (PGP) or a compatible product to encrypt any sensitive information that you send to Cisco. PSIRT can work from encrypted information that is compatible with PGP versions 2.x through 8.x.

Never use a revoked or an expired encryption key. The correct public key to use in your correspondence with PSIRT is the one linked in the Contact Summary section of the Security Vulnerability Policy page at this URL:

[http://www.cisco.com/en/US/products/products\\_security\\_vulnerability\\_policy.html](http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html)

The link on this page has the current PGP key ID in use.

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**Note**

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Use the Cisco Product Identification (CPI) tool to locate your product serial number before submitting a web or phone request for service. You can access the CPI tool from the Cisco Technical Support & Documentation website by clicking the **Tools & Resources** link under Documentation & Tools. Choose **Cisco Product Identification Tool** from the Alphabetical Index drop-down list, or click the **Cisco Product Identification Tool** link under Alerts & RMAs. The CPI tool offers three search options: by product ID or model name; by tree view; or for certain products, by copying and pasting **show** command output. Search results show an illustration of your product with the serial number label location highlighted. Locate the serial number label on your product and record the information before placing a service call.

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## Submitting a Service Request

Using the online TAC Service Request Tool is the fastest way to open S3 and S4 service requests. (S3 and S4 service requests are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Service Request Tool provides recommended solutions. If your issue is not resolved using the recommended resources, your service request is assigned to a Cisco engineer. The TAC Service Request Tool is located at this URL:

<http://www.cisco.com/techsupport/servicerequest>

For S1 or S2 service requests or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly.

To open a service request by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)

EMEA: +32 2 704 55 55

USA: 1 800 553-2447

For a complete list of Cisco TAC contacts, go to this URL:

<http://www.cisco.com/techsupport/contacts>

## Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

Severity 1 (S1)—Your network is “down,” or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Severity 2 (S2)—Operation of an existing network is severely degraded, or significant aspects of your business operation are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Severity 3 (S3)—Operational performance of your network is impaired, but most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Severity 4 (S4)—You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.

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<http://www.cisco.com/en/US/products/index.html>

- Networking Professionals Connection is an interactive website for networking professionals to share questions, suggestions, and information about networking products and technologies with Cisco experts and other networking professionals. Join a discussion at this URL:

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