Data Sheet

1FINITY L110 Lambda Blade

DWDM channel add/drop blade for flexible ROADM networking

1FINITY™ L110 Blade at a Glance

- Management blade for coupler/splitter plug-in units (PIUs) supporting DWDM channel add/drops
- Colorless, Directionless (CD) add/drop architecture for any degree and any wavelength
- Up to 32 C-band add/drop channels per blade
- Optimized for 100G wavelengths and above

Product Overview

The 1FINITY L110 blade provides the management and physical housing for coupler/splitter PIUs supporting colorless, directionless (CD) DWDM add/drop channels for any degree and any wavelength. A single blade houses up to two PIUs, of which there are two configurations available: 1 × 16 and 4 × 16. The L110 blade is directly subtended from either an L100 or L120 blade (depending on the number of degrees needed), and supports both Fujitsu APIs and Open ROADM APIs for SDN-based control in any optical network.

Unified management of one or more Lambda Series blades connected together provides SDN-based wavelength management, including provisioning of standard grid wavelengths or flex-grid throughout the C-band. With flex-grid the user can deploy 100G and higher rate wavelengths and have the infrastructure in place to add higher wavelengths with different grid requirements.

ROADM Configurations

The 1FINITY L110 functions as part of a ROADM system in combination with the L100 and L120 blades. Each L110 blade adds/drops up to 32 DWDM channels into the ROADM with different PIUs inserted into the blade depending on the application. For standard 1–4 degree optical nodes, the 4 × 16 add/drop PIU allows users to select any channel connected to any of the four degrees. For larger nodes (up to eight degrees), the 1 × 16 add/drop PIU connects into the expansion WSS blade, the L120, which helps to conserve optical ports on the main ROADM-on-a-blade, the L100.

1FINITY L100 Series Overview

The 1FINITY L100 Series, Fujitsu's disaggregated optical layer, provides flexible ROADM functionality that easily accommodates rapid bandwidth growth. The series features compact, 1RU globally compliant enclosures and a functionally modular design. These blades provide the building blocks for an open, simple, scalable physical ROADM architecture.

Blades in the Series

The series currently consists of three types of blades:
- **L100** – A twin 1 × 9 wavelength selectable switch (WSS) ROADM-on-a-blade
- **L110** – An optical channel management blade for coupler/splitter plug-in units supporting channel add/drop
- **L120** – An expansion WSS for nodes beyond four degrees

L100 series blades can be deployed in combination with other 1FINITY blades, including the L200 Inline Amplifier, in addition to blades in the Switch and Transport Series.

Equipped to handle any provider's SLA requirements, L100 series blades incorporate dual-feed, fixed DC power supplies and robust, field-replaceable fans. Blades are compatible with various physical installation environments, including 19″ or 23″ standard racks (two- or four-post), as well as the 1FINITY Housing.

ROADM Nodes For New and Existing Networks

Supported Solutions and Applications

Fujitsu solutions and applications supported by the L110 blade incorporate certified and tested performance characteristics, in addition to SDN provisioning and management, and optical design tool functions. The L110 can be deployed in new or existing optical networks by pairing with it the L100 and/or L120 blades to create a ROADM node up to 8 degrees:

In greenfield scenarios, this node can connect to 1FINITY transport blades to provide an agile 200G network.

In brownfield scenarios, this node can be added as a spur to a FLASHWAVE 9500® multihaul ROADM ring to create a hybrid 10G/100G network that extends the life of the existing platform and protects capital investment.

The L110 is approved for deployment under the Open ROADM Multi-Source Agreement (MSA) that defines interoperability specifications among different vendors, thus enabling optical layer flexibility and software control.

Device Management and Control

1FINITY L100 series blades are supported by the Fujitsu Virtuora® software platform, including Virtuora WDM Planning and Design; Virtuora Network Management; Virtuora WDM Control Applications; and Virtuora NC (network controller).

For easier management and simpler deployment of high-capacity ROADM configurations, the 1FINITY L100 series blades also work with the 1FINITY C200 Series Communications Integrator. Each C200 unit provides sufficient management ports for up to 35 individual blades, consolidating multiple IP addresses and DCN connections into a single logical node for the SDN controller.
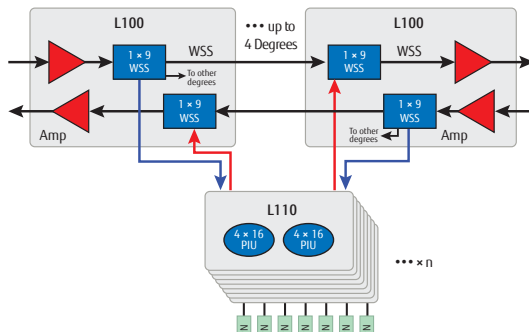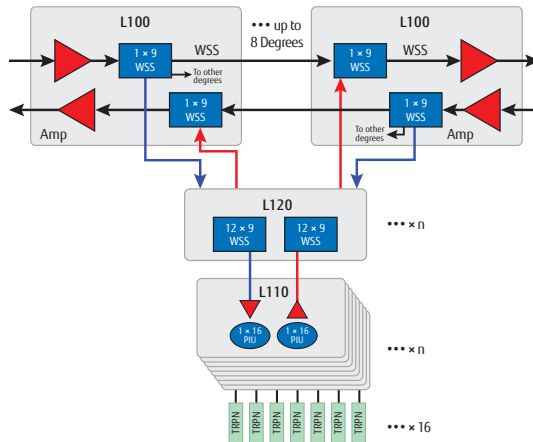

Up to 4-Degree CD-ROADM Node

Lambda blades:
- L100: One ROADM-on-a-blade per degree
- L110: One or more management blades for 4 × 16 add/drop PIU

Capabilities:
- Up to 128 clients

Up to 4-degree CD-ROADM node configuration with transponders (TPR)

Up to 8-Degree CD-ROADM Node (Open ROADM API Only)

Lambda Blades:
- L100: One ROADM-on-a-blade per degree
- L110: One or more management blades for 4 × 16 add/drop PIU
- L120: One or more twin 12 × 9 WSS blades

Capabilities:
- Up to 480 clients

Up to 8-degree CD-ROADM node configuration with transponders (TPR)

Technical Specifications

Base System

System Configuration	1RU optical channel management blade
PIU/FRU per Blade	2
Local Management Port (LMP)	1 × 10/100 Mbps Ethernet RJ-45
Management Port (LCN)	4 × Gigabit Ethernet SFP (T, SX, LX, EX, ZX)
Front LEDs	System Status, Severity, and Port
Fans	2 replaceable fan units
Power Supply	Dual-feed, fixed DC power supply

Line Interface

Line Ports per Blade	Based on PIUs installed
Line Rate	100 Gbps, 200 Gbps, Future 400 Gbps
Tx Wavelength	1528.77–1566.72 nm
Rx Wavelength	1528.77–1566.72 nm

Performance Monitoring

Service PMs	24-hour, 15-min
Thresholds and TCA	Support (user assignable)

Management

Virtuora NC	Yes
Web GUI	Yes
CLI	Yes
NETCONF / YANG	Yes
SNMP	SNMP v1, v2c
Communications	SSH, SFTP, FTP, Telnet, HTTP, HTTPS
Timing	NTP
In Band Mgmt	OSC
OSMINE Support	CLEI

Physical Characteristics

Blade Physical Dimensions (H × W × D)	1.75" × 19" × 17.72" (44.45 × 483 × 450 mm) W = 19" or 23" with mounting rails D < 23.6" (600 mm) with fiber management
Rack Compatibility	19" and 23"
Supported in Housing	Yes
Weight	6.08 kg (13.40 lbs)

Operating Environment

Operating Temperature	+5 to +40 ℃
Short-Term Temperature	5 ℃ to +50 ℃
Operating Humidity	5% to 85%

Power

Power Supply	Dual fixed power supply
120 V AC	No
-48 V DC	-40 V DC to -57 V DC
Power Consumption	125 W

Regulatory and Compliance

FCC	FCC Part 15, Class A
NEBS	NEBS Level 3
UL/CSA	UL60950-1 & IEC60950-1
CE	CE
RoHS	RoHS
CISPR	CISPR 24 & CISPR 32
ETSI	EN 300-019, EN 300-132, EN 300-753, EN 300-386
WEEE	WEEE
RCM	RCM
CDRH	FDA CDRH

ROADM Capacity and Functions

Configuration	Colorless, directionless WDM Channel Add/drop
ROADM degrees	N/A
Wavelengths Range	1528.77–1566.72 nm
Maximum Number of Channels per Degree	96 (50 GHz ITU-T fixed grid) 128 (flex-grid)
Maximum System Capacity	25.6T (200G × 128 channels) per degree
Span Loss	N/A
Optical Supervisory Channel (OSC)	N/A

LASER SAFETY CLASSIFICATION & CAUTION
Compliant with IEC/EN 60825-1, -2 laser standards

CLASS 1M CAUTION
Invisble laser radiation
Do not view directly with optical instruments
Class 1M laser product

HAZARD LEVEL 1M CAUTION
Hazard level 1M laser radiation
Do not view directly with non-attenuating optical instruments

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