

Data Sheet

1FINITY L110 Lambda Blade

DWDM channel add/drop blade for flexible ROADM networking

1FINITY™ L110 Blade at a Glance

- Optical channel management blade for coupler/splitter plug-in units (PIUs) supporting channel add/drops
- Up to 32 DWDM channels via 2 × PIU per blade
- Channels can be programmed to any degree and any wavelength
- Optimized for 100G and above wavelengths



Product Overview

The 1FINITY L110 blade provides the management and physical housing for optical DWDM channels, which are added into the blade via PIUs. By cascading additional L110 blades, growth and expansion needs can be met for both the optical node and add/drop channel.

Unified management of one or more L100 Series blades (L100, L110 and L120) connected together provides SDN-based wavelength management. This includes provisioning of standard grid wavelengths or flex-grid throughout the C-band. With flex-grid the user is able to deploy 100G/200G wavelengths and have the infrastructure in place to add higher wavelengths with different grid requirements. The L110 blade functions as a subtended blade from an L100 or L120 system and supports both Fujitsu APIs and open APIs for SDN-based control in any optical network.

ROADM Configurations

The 1FINITY L110 is not meant to function on a stand-alone basis, but rather 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. Different PIUs may be inserted into the L110 blade depending on the application. For standard 1–4 degree (4D) optical nodes, the 4 × 16 PIU allows users to select any channel connected to any of the four degrees. For larger nodes (beyond 4D), the 1 × 16 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:

- **The L100** – A twin 1 × 9 wavelength selectable switch (WSS) ROADM-on-a-blade
- **The L110** – An optical channel management blade for coupler/splitter plug-in units supporting channel add/drop
- **The 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 and L300 2-degree ROADM, 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 up to Four Degrees

Supported Solutions and Applications

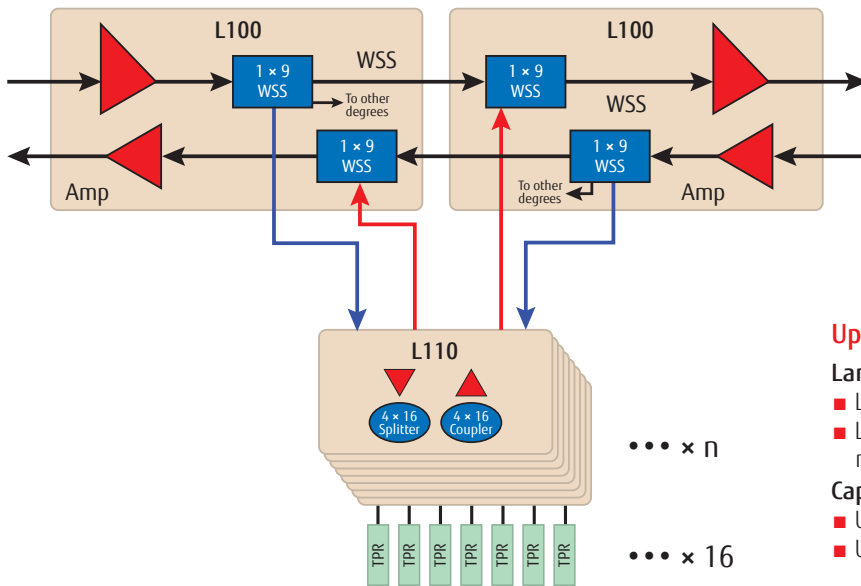
Fujitsu applications and solutions supported by the L110 blade incorporate certified and tested performance characteristics, in addition to SDN provisioning and management, and optical design tool functions. The L110 can be deployed in new or existing optical networks by pairing with it the L100 and/or 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.

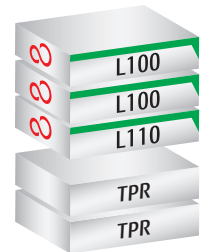
■ The L110 is also approved for deployment under the Open ROADM Multi-Source Agreement (MSA) that defines interoperability specifications among different vendors, thus enabling optical layer flexibility and software control.

SDN 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).



Deg	# of A/D
1	96
2	128
3	112
4	96



Up to 4-Degree CD-ROADM Node

Lambda blades:

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

Capabilities:

- Up to 4-degree support
- Up to 128 clients

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

Technical Specifications

Base System		Operating Environment	
System Configuration	1RU optical channel management blade	Operating Temperature	+5 to +40 °C
PIU/FRU per Blade	2	Operating Humidity	5% to 85%
Local Management Port (LMP)	1 × 10/100 Mbps Ethernet RJ-45	Power	
Management Port (LCN)	4 × Gigabit Ethernet SFP (T, SX, LX, EX, ZX)	Power Supply	Dual fixed power supply
Front LEDs	System Status, Severity, and Port	120 V AC	No
Fans	2 replaceable fan units	-48 V DC	-40 V DC to -57 V DC
Power Supply	Dual-feed, fixed DC power supply	Power Consumption	125 W
Line Interface		Regulatory and Compliance	
Line Ports per Blade	Based on PIUs installed	FCC	FCC Part 15, Class A
Line Rate	100 Gbps, 200 Gbps, Future 400 Gbps	NEBS	NEBS Level 3
Tx Wavelength	1528.77–1566.72 nm	UL/CSA	UL60950-1 & IEC60950-1
Rx Wavelength	1528.77–1566.72 nm	CE	CE
Performance Monitoring		RoHS	RoHS
Service PMs	24-hour, 15-min	CISPR	CISPR 24 & CISPR 32
Thresholds and TCA	Support (user assignable)	ETSI	EN 300-019, EN 300-132, EN 300-753, EN 300-386
Management		WEEE	WEEE
Virtuora NC	Yes	RCM	RCM
Web GUI	Yes	CDRH	FDA CDRH
CLI	Yes	ROADM Capacity and Functions	
NETCONF / YANG	Yes	Configuration	Colorless, directionless WDM Channel Add/drop
SNMP	SNMP v2, v3	ROADM degrees	N/A
Communications	SSH, SFTP, FTP, Telnet, HTTP, HTTPS	Wavelengths Range	1528.77–1566.72 nm
Timing	NTP	Maximum Number of Channels per Degree	96 (50 GHz ITU-T fixed grid) 128 (flex-grid)
In Band Mgmt	OSC	Maximum System Capacity	25.6T (200G × 128 channels) per degree
OSMINE Support	CLEI	Span Loss	N/A
Physical Characteristics		Optical Supervisory Channel (OSC)	N/A
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	<div style="border: 1px solid black; padding: 5px; display: inline-block; width: 45%;"> LASER SAFETY CLASSIFICATION & CAUTION Compliant with IEC/EN 60825-1, -2 laser standards </div> <div style="border: 1px solid black; padding: 5px; display: inline-block; width: 45%; margin-left: 10px;"> CLASS 1M CAUTION <i>Invisible laser radiation</i> 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 </div>	
Rack Compatibility	19" and 23"		
Supported in Housing	Yes		
Weight	6.08 kg (13.40 lbs)		

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