2-PORT 100G DWDM PTX PIC

Product Overview

Juniper Networks 2-port 100G DWDM PIC enables Service Providers to deploy an ultra-long reach, Coherent 100G DWDM router interface without sacrificing port density. Utilizing the latest coherent receiver technology, the 2-port 100G DWDM PIC can support distances of over 2000 kilometers without regeneration for 100G long reach supercore deployments.

Product Description

Juniper Networks® PTX Series Routers are architected to deliver industry leading system density in a feature-optimized design that delivers the ability to scale, rapidly qualify and deploy, and reliably support their core—at almost half the power of other core routers. Powered by Junos Express chip set the PTX Series deliver line rate, low latency packet performance, at up 480 Gbps per slot, even for the smallest packet sizes. The 2-port 100G DWDM PIC continues to build on the Supercore value by delivering the first phase of Junipers Packet-Optical vision for the PTX family, giving Service Providers the ability to deploy up to 32 ports of tunable, long reach 100G DWDM Router interfaces for ultra-high speed packet optical core applications.

With a 2-port 100GbE CFP PIC and the 2-port 100G DWDM PIC the PTX Series gives Service Providers the benefit of allowing them to pick the right interface for their network and not give up port density.

The 2-port 100G DWDM PIC is a key component in deploying a simplified, collapsed packet-optical core network architecture. By shifting the coherent transponder into the router Service Providers can remove cost, and they don't pay a 100G "long reach penalty" on port density in the PTX.

Architecture and Key Components

The 2-port 100G DWDM PIC leverages the latest OIF compliant optical technology to deliver an interface that can be tuned to any of 96 ITU extended C-Band channels. The 2-port 100G DWDM PIC provides a DP-QPSK optical interface and utilizes a coherent MODEM ASIC to provide SD-FEC ensuring the longest reach possible for transmission on legacy Fiber infrastructure. The 2-port 100G DWDM PIC supports full OTN performance monitoring, and full control and monitoring via JUNOS CLI and SNMP.

Long Reach 100G DWDM in the PTX Router: Enabling Simplified, Reliable, Lower Cost Network Designs

As Network Operators seek ways to accommodate unrelenting growth while trying to contain costs, they seek next generation solutions that can scale efficiently. By integrating transponder functions into the core router, SP's can free up rack space, reduce power consumption and reduce the cost, which takes a step closer to converging layers in the core. The 2-port 100G DWDM PIC gives Operators the ability to begin that migration without making the sacrifice of port density found in competitive alternatives.
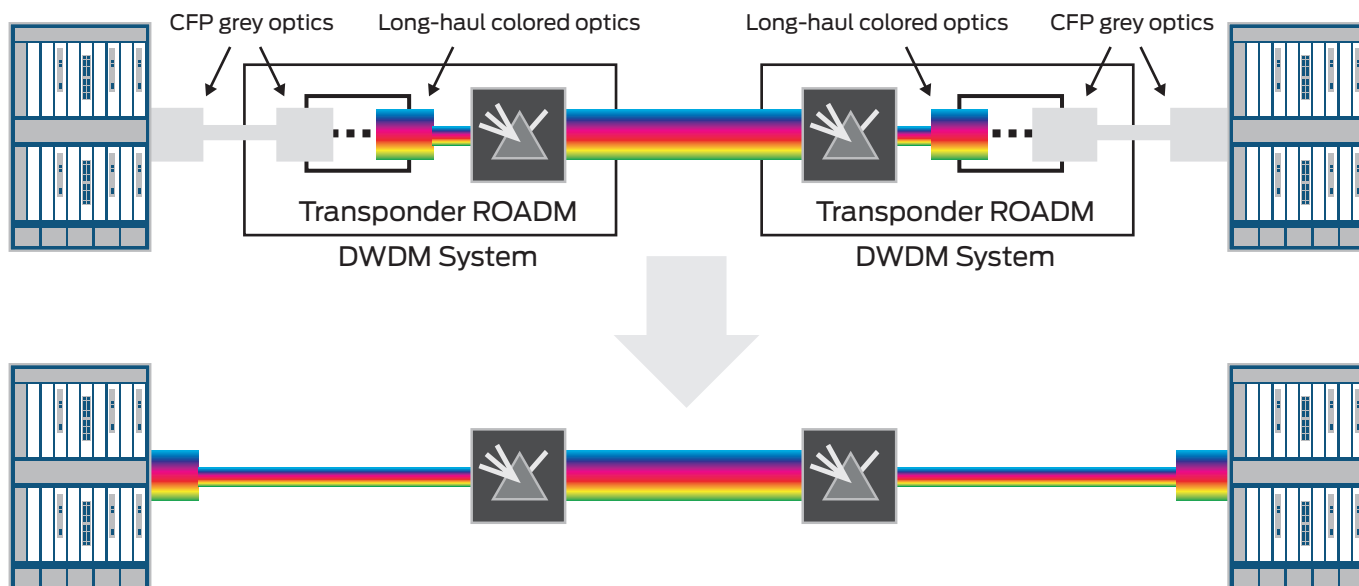
Figure 2. Router 100GbE Grey Optics and DWDM Designs

In the top example of figure 2, a standard configuration using 100G CFP PIC's in the PTX Routers and DWDM Switching Systems consist of 2 CFP's and a transponder at 2 sites, for a total of 4 CFP's and 2 transponders. In the bottom configuration the 2-port 100G DWDM PIC is used at each end, creating a simplified, more efficient, lower cost solution.

Features and Benefits

The 2-port 100G DWDM PIC delivers:

- Up to 32 ports of tunable 100G DWDM per PTX5000
- OTU-4 Framing
- Support for distances in excess of 2000km
- Fully tunable to any of 96 ITU extended C-Band Channels (50Ghz Spacing)
- Full OTN Monitoring and control
- Junos CLI and SNMP Interfaces
- Concatenated Forward Error Correction with SD-FEC inner code and GFEC outer code

The following table lists the number of 10GbE and 100GbE interfaces supported per chassis

Table 1: PIC Interfaces Supported

Platform	Ports Per Chassis			
	10GbE SFP+	40GbE CFP	100GbE CFP	100G DWDM
PTX5000	384	32	32	32
PTX3000	192	16	16	16

Table 2: PIC Feature Details

Feature	Description
Supported Platforms	PTX5000, PTX3000
Data rate	OTU4v mode: 127.14 Gbits/s
Optics	DP-QPSK with Coherent Receiver
Connector Type	LC - Straight
Channel range	191.25 THz to 196 Thz.
Framing	ODU4v
Forward Error Correction	G.709 FEC + SD-FEC
OSNR sensitivity	14.5 dB EOL
CD tolerance	50,000 ps/nm
PMD tolerance	80 ps DGD
Tx optical output power	-2 dBm
Rx optical input power	-18 to -5 dBm

Software Features

Complete monitoring, provisioning and management of the 2-port 100G OTN PIC is provided through JunOS. The on board OTN framer provides full access to ITU-T G.709 OTN overhead. Specifically, the following functionality is supported:

- Support of all JunOS CLI commands for the PTX5000 features including the ability to fully manage the 2-port 100G OTN PIC
- SNMP v2c and v3 support
- Support for RFC 3591 – Definitions of Managed Objects for the Optical Interface Type and draft-galimbe-kunze-black-link-mib-00
- Performance monitoring for all relevant OTN and Optical counters and guages, including 15min and 24Hr buckets and associated TCAs
- GR-1093 based state management for OTN PICs and OTN 100G ports
- Fault management and suppression based on ITU-T G.798 for the OTN layer

Physical Dimensions

P1-PTX-2-100G-C-WDM-C

- 7.75" x 11" (196.8mm x 279.4mm)

Weight
- 20 lbs (9.07kg)

Power
- 311 watts (Maximum)

Network Management
- Simple Network Management Protocol (SNMP)
- JunosSpace Command-Line Interface (CLI)

Standards Compliance and Interoperability

Optical Standards
- Telcordia GR-63 Issue 4: 2012
- EN 60825-1 (2007) Safety of Laser Products - Part 1: Equipment classification and requirements
- FDA CDRH21 CFR-1040

Environment
- Operating Temperature: 32° to 104° F, 0° to 40° C
- Storage Temperature: -40° to 158° F, -40° to 70° C
- Relative Humidity: (Operating) 5 to 90% non-condensing

Safety
- CAN/CSA-C22.2 No. 60950-1 (2007) Information Technology Equipment - Safety
- UL 60950-1 (2nd Ed.) Information Technology Equipment - Safety
- EN 60950-1 (2005) Information Technology Equipment - Safety
- IEC 60950-1 (2005) Information Technology Equipment - Safety (All country deviations)
- EN 60825-1 +A1+A2 (1994) Safety of Laser Products - Part 1: Equipment Classification

Electromagnetic Compatibility
- EN 300 386 V1.4.1 (2008) Telecom Network Equipment - EMC requirements
- EN 55024 +A1+A2 (1998) Information Technology Equipment Immunity Characteristics

EMI
- FCC CFR 45, Part 15 Class A (2009) USA Radiated Emissions
- EN 55022 Class A (2006)+ A1 2007 European Radiated Emissions
- VCCI Class A (2007) Japanese Radiated Emissions
- BSMI CNS 13438 and NCC C6357 Taiwan Radiated Emissions
- AS/NZS CISPR22:2009

Customer Specific Requirements
- GR-63-Core (2006) Network Equipment, Building Systems (NEBS) Physical Protection
- GR-1089-Core Issue 5 (2009) EMC and Electrical Safety for Network Telecommunications Equipment
- SR-3580 (2007) NEBS Criteria Levels (Level 3)
- ETSI EN 300 019: Environmental Conditions & Environmental Tests for Telecommunications Equipment
- ETSI EN 300 019-2-1 (2000) – Storage
- ETSI EN 300 019-2-2 (1999) – Transportation
- ETSI EN 300 019-2-3 (2003) – Stationary Use at Weather-protected Locations
- ETSI EN 300 019-2-4 (2003) – Stationary Use at Non-Weather-protected Locations
- ETS 300753 (1997) – Acoustic noise emitted by telecommunications equipment
- 1 TR 9 (2005) Deutsche Telekom EMC Specification
- British Telecom EMC Immunity Requirements (2004)
- ITU-T K.21 (2003) Resistibility of telecommunication equipment installed in customer premises to over voltages and over currents

Mandatory Power Supply Markings
- Power Supply integrated in system (with metal enclosure or open frame)
  - UL, CSA: UL/CSA 60950-1 (2007)
  - TUV: EN 60950-1 2nd Edition (2005)
  - CE: EN55022 Class B (2006), EN55024 + A1 + A2 (1998), EN60950-1 2nd Edition (2005)
  - China CCC
  - Argentina IRAM/S-mark

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Ordering Information

Model Number	Description	Platform
P1-PTX-2-100G-C-WDM-C	2-port 100G DWDM PIC	PTX5000, PTX3000

About Juniper Networks

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