

INFOBRIEF | WAVELOGIC TECHNOLOGIES

# WaveLogic 6 Nano 1.6T Coherent-Lite Pluggable Transceiver

**As AI applications are driving a significant increase in the number of interconnects required inside and around the data center, and traditional intensity modulation-direct detect (IM-DD) technology is starting to hit physical limits, new innovations are required to scale data center designs. Ciena's WaveLogic™ 6 Nano (WL6n) 1.6T Coherent-Lite Pluggable Transceiver delivers the higher loss budget, performance, and reliability required for these applications, all while achieving comparable power consumption and design complexity as IM-DD.**

## What is WL6n 1.6T Coherent-Lite?

This low-power, low-latency coherent pluggable transceiver is design-optimized for shorter-reach data center fabric (2 km) and campus (20 km) applications. As interconnect speeds reach 1.6T and higher line rates, the power consumption of coherent and IM-DD designs starts to converge. Moreover, Coherent-Lite has significant performance benefits over IM-DD: It delivers a higher loss budget, can mitigate for crosstalk, and can scale to higher fiber capacity with WDM.

WL6n 1.6T Coherent-Lite is a dual-carrier coherent transceiver capable of transmitting and receiving up to 1.6 Tb/s aggregate capacity of client payload on

dual wavelengths. Ready for next-generation switches and connectivity demands, this pluggable supports eight 224G SerDes electrical lanes and can transport a mix of 400GbE and 800GbE clients, as well as 1.6TbE client traffic. Leading technology innovation enables the low-power, high-capacity design in a compact OSFP form factor. WL6n 1.6T Coherent-Lite harnesses state-of-the-art 3 nm coherent DSP, implementing dual OIF-compliant 800LR data paths within a single DSP chip. It also uses dual photonic integrated circuits (PICs) to achieve miniaturization of the electro-optic design. WL6n 1.6T Coherent-Lite will be offered<sup>1</sup> in both O-band and C-band pluggable variants to support a range of end-customer and application requirements. In addition, a single fiber bi-directional variant with a circulator can be made available based on customer requirements.

## Where does WL6n 1.6T Coherent-Lite fit?

**Campus applications:** WL6n 1.6T Coherent-Lite can be used to connect individual data center buildings across the campus and supports both dark fiber and WDM applications. For these campus applications, Coherent-Lite delivers higher performance compared to IM-DD, so users can extend low-latency 1.6 Tb/s connectivity across longer distances—up to 20 km using O-band and up to 300 km with C-band. The extended-reach support provides much needed flexibility to cloud providers that are looking to build new data centers near sustainable, cost-effective energy sources and are now able to extend the distance between data centers while still using latency-optimized, high-speed optical interconnect.

1. Availability planned for 1H 2026

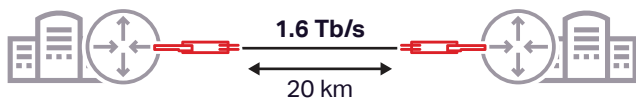


Figure 1. Campus dark fiber application

In contrast to IM-DD options, WL6n 1.6T Coherent-Lite can also scale to deliver higher fiber capacity using WDM—up to 6.4 Tb/s on a single fiber pair using an O-band-based design or up to 25.6 Tb/s with a C-band design.

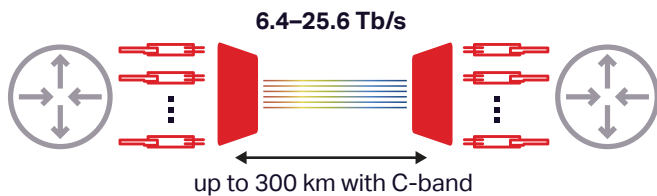


Figure 2. Campus WDM application

**Optical circuit switch (OCS) applications:** Several cloud and AI solution providers are evaluating replacing spine switches in data centers with OCS. The benefits of using OCS are improved power, cost, and availability, with the ability to evolve more simply to new technologies. Conversely, building an OCS fabric does result in higher path loss, with the loss proportional to the OCS radix.

Using Ciena’s WL6n 1.6T Coherent-Lite design for this application delivers a 4dB+ higher loss budget than IM-DD, as well as crosstalk mitigation. In practical terms, the higher margin offered with Coherent-Lite enables a more robust design and prevents the occurrence of link flapping possible with IM-DD. The higher performance of Coherent-Lite also enables a larger OCS radix—more ports and longer paths—as it can support higher loss. This allows users to connect more xPUs across more paths in their existing environments, many of which are often laden with patch panels, leading to increased loss budgets. To minimize the number of OCS ports used, a single fiber design can be implemented.

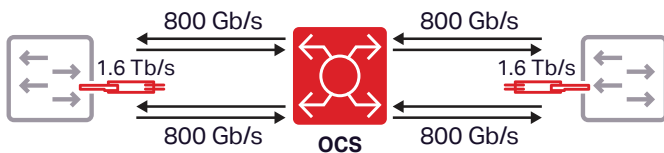


Figure 3. Data center OCS fabric application

Finally, in contrast to IM-DD, Coherent-Lite can also scale to deliver higher fiber capacity using WDM—up to 6.4 Tb/s using O-band optics.

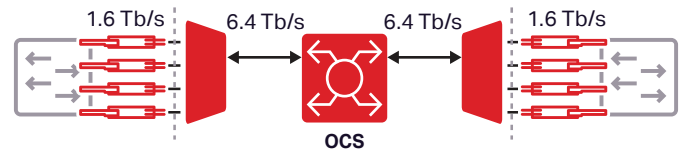


Figure 4. Data center OCS fabric WDM application with single bi-directional fiber

### Why WL6n 1.6T Coherent-Lite?

Harnessing expertise across coherent DSP, high-bandwidth electro-optics, and high-speed packaging, WL6n 1.6T Coherent-Lite provides users with:

- Longer, higher-capacity optical interconnects
- Massive scaling and flexibility needed for next-generation data center design
- The ability to extend low-latency 1.6 Tb/s connectivity across longer distances in campus applications, providing much needed flexibility to build new data centers near sustainable, cost-effective energy sources
- The ability to evolve to OCS fabric architectures to connect more xPUs across more paths in their existing environments, many of which are often laden with patch panels that increase loss budgets

Key WL6n Coherent-Lite features include:

- 1.6 Tb/s data throughput within a single pluggable via dual-carrier 800LR implementation within a single coherent ASIC
- Interoperable 800LR transmission, compliant with OIF/IEEE 800LR coherent specifications
- Support for multiple client interfaces: 400GbE, 800GbE, and 1.6TbE
- 8 dB target loss budget
- 8 x 224G electrical lanes
- Tx output power per channel: -10 to -7 dBm range
- C- and O-band pluggable variants
- WDM photonic line channel plan: 150 GHz, flexible grid
- Single-fiber bi-directional variant can be made available

WL6n 1.6T Coherent-Lite transmission mode information

Transmission mode	Standard name	Rate (Gb/s)	Modulation	Baud (GBaud)	FEC
1.6T (2 x 800LR)	OIF/IEEE 800LR	1.6 Tb/s	16QAM	124	BCH2

A new era of networking

With the massive growth in data center interconnects fueled by new AI architectures, new innovative approaches are needed to solve connectivity challenges within and around the data center. Ciena’s latest optical innovation, WL6n 1.6T Coherent-Lite, powered by advanced 3 nm CMOS, enables longer, higher-capacity optical interconnects, bringing new levels of scale and flexibility for data center designs.

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