

Nokia 1.6T DR8 OSFP LPO Transceiver

Linear-drive Pluggable Optics (LPO) reduce power consumption for high-speed intra-data-center connectivity by eliminating the power-hungry digital signal processor (DSP) used in conventional fully retimed optical modules. This streamlined architecture lowers module power and latency while retaining the operational flexibility of a pluggable form factor. Designed and built for scale-out applications, the Nokia 1.6T DR8 OSFP LPO transceiver delivers 1.6 Tb/s high-performance optical connectivity for next-generation AI clusters and data center fabrics. With power consumption under 10 W, a 75% reduction compared to fully retimed (FRO) solutions, Nokia 1.6T DR8 OSFP LPO enables data center operators to scale their AI infrastructure with power-efficient, high capacity and high-density optical pluggable solutions.

Supporting IEEE 802.3dj 1.6TBASE-DR8 specifications over eight lanes of single-mode fiber, Nokia 1.6T DR8 OSFP LPO supports up to 500 m reach using 106.25 Gbaud PAM4 modulation per lane, making it the ideal LPO solution for AI GPU cluster interconnects, spine-leaf fabric, and high-density optical connectivity deployments.

Powered by Nokia's Infinite Capacity Engine – Data Center (ICE-D) DR8 Photonic Integrated Circuit (PIC), Nokia 1.6T DR8 OSFP LPO combines industry-leading power efficiency with a standard OSFP form factor. The ICE-D PIC is paired with a Silicon-Germanium (SiGe) driver, co-designed and co-packaged to minimize losses and improve signal integrity.

Powered by Nokia ICE-D DR8 PIC

Taking advantage of the unique capabilities of its U.S.-based optical semiconductor fab, Nokia's ICE-D DR8 PIC is a highly integrated solution that



combines multiple optical functions (e.g., lasers, modulators, drivers) onto a single monolithic chip, resulting in industry-leading density, low latency and power efficiency. The ICE-D DR8 PIC is a monolithic indium phosphide (InP) highly integrated PIC designed to deliver ultra-low power and scalable optical intra-data center connectivity for the AI era. It integrates four distributed-feedback (DFB) lasers, an eight-channel Mach-Zehnder (MZM) array and eight semiconductor optical amplifiers (SOAs). ICE-D DR8 PIC design implements a complete O-band transmitter for 1.6 Tb/s, 106 Gbaud PAM4 IEEE-based DR8 applications, such as Nokia 1.6T DR8 OSFP LPO. The ICE-D DR8 PIC's highly integrated design contains an absolute minimum of subcomponents to deliver industry-leading performance, higher reliability and high-volume manufacturability.

Key features

- Low power consumption (<10 W per module) over 0-70 C case temperature
- High output power (1-5 dBm fiber coupled)
- Superior performance (e.g., TDECQ, RLM)
- IEEE 802.3dj 1.6TBASE-DR8 compliant LPO module

- 500 m reach on G.652.D single-mode fiber
- Standard OSFP form factor optimized for LPO deployment
- Dual MPO-12/APC optical interface
- Ultra-low insertion loss enabling superior link budgets
- DR8 architecture optimized for 100Gbd/lane PAM4
- Powered by Nokia ICE-D DR8 PIC – scalable to 3.2 Tb/s on the same platform
- High manufacturing consistency for volume hyperscale deployments

Applications

- LPO-based AI/ML GPU cluster optical interconnects
- Hyperscale data center spine-leaf fabric with LPO architecture
- 1.6T switch-to-server and switch-to-switch LPO links
- Cloud and enterprise data center core switching with LPO efficiency
- Power-constrained data center environments where LPO is mandated

Technical specifications

Parameter	Min	Max	Unit
Power Consumption	—	10	W
Lane Wavelength (range)	1304.5	1317.5	dBm
Average Launch Power, each lane	2	5.0	dBm
OMAouter, each lane	—	4	dBm
OMAouter, each lane (min) for TDECQ < 1.4 dB	-0.8	—	dBm
OMAouter, each lane (min) for 1.4 dB ≤ TDECQ ≤ 3.4 dB	-2.2 + TDECQ	—	dBm
TDECQ, each lane	—	3.4	dB
Receive Power	-1	-4	dBm
Case Temp	0	70	°C
Humidity	5	85	%

Standard	Specification
IEEE 802.3dj	1.6TBASE-DR8
LPO-MSA	224G LPO Module Specification
OSFP MSA	OSFP1600 Power Class 4.

Part Number	Description
LPO-DR1600-00	Nokia 1.6T DR8 OSFP LPO 1310nm 500m

About Nokia

Nokia is a global leader in connectivity for the AI era. With expertise across fixed, mobile, and transport networks, powered by the innovation of Nokia Bell Labs, we’re advancing connectivity to secure a brighter world.

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Document code: (September) CID215574