

Nokia Tahoe 800G DSP

Designed to power the new generation of high-performance coherent pluggables

Coherent pluggable optics are driving a new network economy by reducing power consumption, footprint, and cost, and by simplifying the network architecture.

Tahoe 800G is a high-performance digital signal processor (DSP), designed to power the new generation of multi-vendor interoperable ZR/ZR+ coherent pluggable optics, operating at rates from 200G to 800G.

Tahoe 800G is a low-power 3-nm CMOS technology digital ASIC that processes data for transmission over an optical fiber and extracts it upon reception. Its functions include:

- Modulation encoding and decoding
- Analog-digital conversion
- Spectral shaping
- Carrier, polarization, and clock recovery
- Compensation for channel distortions
- Probabilistic constellation shaping (including open PCS)
- Forward Error Correction (FEC) algorithms (including CFEC, OFEC) error correction algorithms

Tahoe 800G has been optimized to maximize wavelength capacity over any distance. This is enabled by Tahoe 800G ability to compensate for large amounts of chromatic dispersion; by its support for multiple modulation formats, such as QPSK and 16QAM, and highly programmable symbol rates up to 135 GBaud, and its implementation of advanced PCS and FEC algos. Tahoe 800G also includes a high-performance DAC/ADC and uses high-bandwidth radio frequency (RF) interconnects to minimize noise generation.

Tahoe 800G DSP offers streaming telemetry, for real-time performance monitoring.

Tahoe 800G DSP is available for integration into pluggable DCOs and can be combined with Nokia ICTR140 TROSA or with a third-party optical front-end.

Interoperability

Tahoe 800G DSP is fully programmable, supporting not only custom high-performance modes, but also modes compatible with 800ZR OIF, 400ZR OIF, Open ZR+ and OpenROADM standards. It supports CFEC and OFEC, as well as open PCS.

Tahoe 800G offers a I2C/CMIS-compliant host interface, with CMIS and C-CMIS support.



The image shown is for illustration purposes only and may not be an exact representation of the product.

Applications

- Point-to-point cloud/data center interconnect (DCI)
- Metro/core aggregation
- Core transport
- Ethernet transport
- IP over DWDM (IPoDWDM) with Tahoe-enabled DCO hosted in router/switch or compact Layer 1 optical transport cards in a DWDM platform

Key benefits of Tahoe

High-performance: With large chromatic dispersion compensation and offering advanced and open probabilistic constellation shaping (PCS), and multiple modulation formats, Tahoe maximizes wavelength capacity over any link.

High-efficiency: Tahoe has been designed for low power consumption, compact footprint and high reliability.

Ease of integration: Tahoe deploys quickly into digital coherent optics (DCO) in various compact pluggable form factors such as QSFP-DD800 and OSFP.

Deployment flexibility: Tahoe is suitable for multi-haul and multiple applications, from data center and cloud interconnect to metro/core aggregation, and regional and long-haul transport. It enables Ethernet transport, and IPoDWDM architectures.

Interoperability: Tahoe is compatible with 800ZR OIF, 400ZR OIF, Open ZR+ and OpenROADM.

It supports CFEC and OFEC, as well as open PCS.



Key technical specifications (preliminary)

Total capacity	800G per wavelength
Line rates	200Gb/s to 800Gb/s
Client-side interfaces/protocols	8x100 GbE (100GAUI-1, 100GAUI-2) 4x200 GbE (200GAUI-4, 200GAUI-2) 2x400 GbE (400GAUI-8, 400GAUI-4) 1x800 GbE (800GAUI-8)
Symbol rate	60-135 Gbaud
Modulation formats	16QAM, 16QAM-PS, QPSK
Suitable for form factors	QSFP-DD, OSFP

Mode type	800ZR	400ZR	800G-OR	600G-OR	400G-OR ULR	400G ZR+	200G ZR+	Custom high-performance modes*
Interoperable standard/MSA	OIF	OIF	OpenROADM	OpenROADM	OpenROADM	OpenZR+	OpenZR+	Custom
Baud rate (GBd)	118	60	131	119	118	60	60	Up to 135GBd
Modulation format	16QAM	16QAM	16QAM-PCS	16QAM-PCS	QPSK	16QAM	QPSK	16QAM-PCS
FEC algorithm	OFEC	CFEC	OFEC	OFEC	OFEC	OFEC	OFEC	LDPC
Supported ethernet client modes	800GbE-ETC	400 GbE	800GbE-ETC 400 GbE 200 GbE 100GbE	400 GbE 200 GbE 100GbE	400 GbE 200 GbE 100GbE	400 GbE 200 GbE 100GbE	200 GbE 100GbE	800GbE-ETC, 400 GbE 200 GbE 100GbE
Reach** [km]	140	140	1100	1650	2650	1750	4700	Mode-dependent

Data in this table is preliminary and may be subject to update with experimental validation.

*Custom modes, including proprietary FEC modes, are available. Please contact your Nokia sales contact.

**Reach in colorless, directionless ROADM configurations, over SMF-28 fiber, when combined with best-in-class Nokia ICTR140 TROSA front-end

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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