

OpenROADM oFEC (Open Forward Error Correction) is a core element of the OpenROADM initiative, providing a standardized, open-source FEC solution for high-speed coherent optical networks.

Creonic's oFEC IP cores deliver high coding gain through a fully parallel, pipelined decoder architecture with 3 soft-decision (SD) and 2 hard-decision (HD) decoding steps. It supports data rates from 200G to 800G, including Probabilistic Constellation Shaping (PCS) modes to enhance spectral efficiency, noise tolerance, and transmission reach.

In addition to the FEC engine, the solution includes an interleaver/de-interleaver and parallel CRC checks for final payload validation. An FPGA version operating at 10 Gbps is available for prototyping, testing, and lower-bandwidth use cases.

Optimized for low latency, energy efficiency, and seamless integration, the oFEC core enables reliable high-speed transmission for hyperscale data centers, telecom infrastructure, and high-performance computing.

Benefits

- Support all modes in OpenROADM 6.0 and OpenZR+.
- Support Probabilistic Constellation Shaping (PCS).
- Support QPSK, 8-PSK, 16-QAM, and 16-QAM PCS.
- Payload throughput of 200G/400G/600G/800G on ASIC.
- Payload throughput of 10Gbps on FPGA.
- Low-power and low-complexity design.
- Available for ASICs and FPGAs (Xilinx).

Features

- Compliant with "Open ROADM MSA 6.0 W B400G Port Digital Specification (400G-800G)".
- Compliant with "OpenZR+ 200G/400G/600G/800G".

Applications

- High-speed coherent optical communication up to 800G
- Long-haul and metro optical transport
- Multi-vendor interoperability
- OpenZR+ and pluggable coherent optics

Deliverables

- SystemVerilog source code or synthesized netlist
- HDL simulation models e.g. for Aldec's Riviera-PRO
- VHDL testbench
- Bit-accurate Matlab, C or C++ simulation model
- Comprehensive documentation

About Creonic

Creonic is an ISO 9001:2015 certified provider of ready-for-use IP cores for wired, wireless, fiber, and free-space optical communications. All relevant digital signal processing algorithms are covered, including, but not limited to, forward error correction, modulation, equalization, and demodulation. The company offers the richest product portfolio in this field, covering standards like 3GPP 5G, DVB-S2X, DVB-RCS2, CCSDS, and WiFi. The products are applicable for ASIC and FPGA technologies and comply with the highest requirements with respect to quality and performance. For more information please visit our website at www.creonic.com.

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