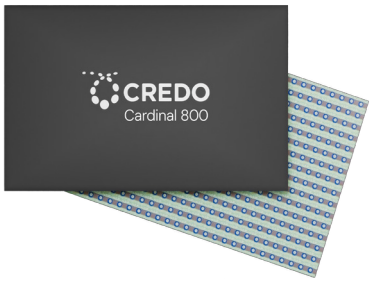
PRODUCT BRIEF > OPTICAL DSP

Optical DSP
Cardinal 800



3nm 224G/Lane PAM4 DSP

The Cardinal 800 optical DSP delivers 224 Gbps-per-lane PAM4 signaling and is purpose-built for 800 Gb/s and 1.6 Tb/s optical transceivers supporting the demanding requirements of next-generation AI fabrics, supercomputing clusters, and hyperscale data centers.

Built on advanced 3nm VCMOS technology and leveraging Credo's proprietary high-performance design techniques, the Cardinal 800 provides industry-leading power efficiency, ultra-low latency, and exceptional signal integrity. Cardinal 800 is engineered specifically for architectures requiring lower output swing or when using discrete laser driver components for specialty silicon photonics or VCSELs.

The Cardinal 800 is offered as a bare-die solution, enabling 1.6 Tb/s optical modules with power consumption below 22 W, depending on optical components. With sub-40 ns latency or optional concatenated FEC, the Cardinal 800 enhances end-to-end system efficiency and is suitable for scale-out and scale-up deployments.

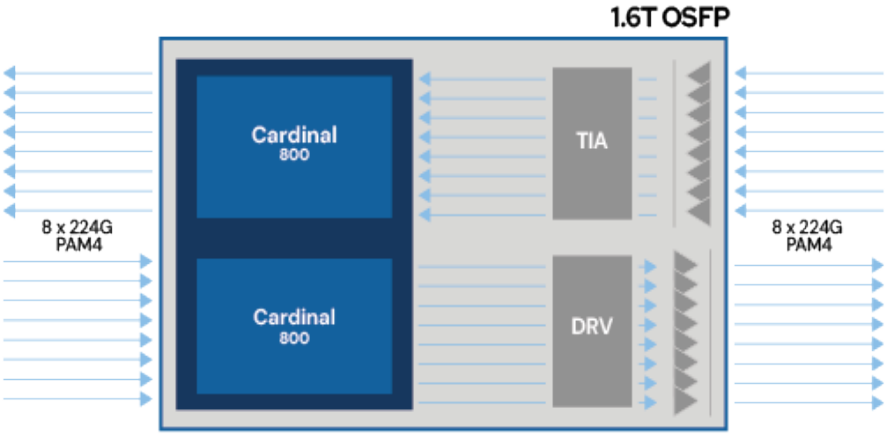
To maximize uptime and maintain system reliability, the DSP includes a comprehensive suite of real-time telemetry features such as SNR monitoring, eye-quality metrics, FEC statistics, and BER measurement. Additional offline diagnostic tools—including PRBS generators/checkers, host and line loopbacks, and dedicated clock outputs—support rapid bring-up, system validation, and in-field instrumentation.

Applications

- 1.6Tb/s optical transceivers
- 1.6Tb/s AOCs
- 800Gb/s optical transceivers
- 800Gb/s AOCs
- Near Package Optics (NPO)
- Co-Packaged Optics (CPO)
- Breakout applications

Key Parameters

- Host Side: 224G PAM4
- Line Side: 224G PAM4
- Process: 3nm



Key Features

- Ultra-low power dissipation enables higher rack utilization and lower thermal cooling requirements.
- Line- and host-side DSP-based equalization with multi-tap FFE and DFE.
- Line-side receivers include non-linear cancellation, reflection cancellation, and baseline wander correction for challenging optical links.
- Transmitters with multi-tap FIR filters and non-linear cancellation, allowing precise tuning on both the electrical and optical interfaces.
- Low-power, 1Vpp, line-side transmitters provide flexible options for external laser drivers.
- Host-side interface supporting MR reach eliminates the need for custom tuning per channel in different applications.
- Integrated KP4 RS(544, 514) FEC termination and regeneration.
- Support for concatenated Hamming (128, 120) FEC with bypass.
- Real-time IEEE FEC monitor for both KP4 and Hamming FEC.
- Full suite of diagnostic features for real-time link monitoring and offline debug enhances transceiver reliability, system testing and reduces time-to-market..
- Independent phase locked loops per channel enable flexible breakout configurations including 2x800GbE, 4x400GbE and 8x200GbE.
- On-chip crossbar simplifies module layout design.

Supported Standards and Interfaces

- 1.6T - SR8/DR8/FR8
- 2x800G - SR4/DR4/FR4/LR4
- 8x200G - SR/DR/LR2
- 800G – SR4/DR4/FR4
- 800G - SR8/DR8
- CEI-224G - MR
- CEI-112G - MR
- 800GAUI-4, 800GAUI-8
- IEEE 802.3dj
- OSFP MSA
- QSFP224
- CMIS 5.x

For more information please visit **www.credosemi.com**
or email **sales@credosemi.com**

REV 030926