

CS4223 Quad 15 Gbps EDC PHY

Feature Benefits

- Wide operating data rate range of 1 Gbps to 15 Gbps
 - Enables support for all major standards and applications
 - 1/10/40 Gbe, 16/8/4/2G Fibre Channel, Infiniband FDR/QDR/DDR, and CPRI Rate options 1 to 7
- Strong Equalizer performance
 - Up to 15 Gbps operation
 - BER target of 1E-17
- High level of feature integration
 - Integrated 2 × 2 switch for protection switching and broadcast applications
 - Integration of protocol layer features such as CR4/KR4 auto-negotiation and training, and Fibre Channel speed negotiation
 - Integrated AC coupling
- Latency less than 1 ns
 - Critical for financial and data center switch applications

Applications

- 10G SFP+ line cards
- 40G QSFP line cards
- 10Gbase-KR/40Gbase-KR4/CR4 applications
- 16/8/4/2G Fibre Channel applications
- Infiniband FDR/QDR/DDR applications
- CPRI links in 4G Basestations

Product Description

The CS4223 EDC PHY is a serial 15 Gbps Quad PHY with 8 Port CDR Electronic Dispersion Compensation (EDC). The device's 28 nm architecture enables higher port counts and increased faceplate and backplane bandwidth for next generation data center, carrier, and enterprise systems. The CS4223 EDC PHY leads the industry with less than 1 ns latency in a 12 mm × 12 mm package, while lowering power consumption by 50% over previous generations. The CS4223 EDC PHY provides a wide operating frequency range covering 1 GbE, 10 GbE, 1G FC, 2G FC, 4G FC, 8G FC, 16G FC, Infiniband SDR, DDR, QDR, FDR, CPRI Options 1 to 7, and support for all the major standards used in data centers, storage, high performance computing, and wireless backhaul applications including 1 GbE, 10 GbE, 40 GbE, 100 GbE, InfiniBand, Fibre Channel, CPRI, and OBSAI.

The CS4223 EDC PHY functionality supports four full-duplex 10G links, or one full-duplex 40G link. EDC capability allows the device to operate with linear SFP+/QSFP optical modules, Direct Attach Copper, 40GBase-CR4 cables, and 10GBase-ZR and DWDM SMF applications. The device is fully compliant to 10G SFP+, 802.3ba 40G and 100G nPPI, and nAUI specifications. The fully autonomous device does not require external processors to control the convergence or dynamic adaption of the dispersion compensation. The CS4223 EDC PHY also integrates the auto negotiation and coefficient training functionality for 40G KR4/CR4 applications, and rate negotiation 16G Fibre channel, for seamless interoperability with existing equipment.

The CS4223 EDC PHY includes an integrated 2 × 2 switch enabling redundant backplane and faceplate applications without needing an external crossbar device. The integrated switch functionality supports 1+1 protection switching and broadcast functionality in both directions. The device supports link quality monitoring for the inactive redundant link to enable fast switching. In addition, the CS4223 EDC PHY has a fully symmetric architecture with EDC capability on both ingress and egress directions. This enables applications such as translation from KR4 backplane to CR4 cable in blade server designs using a single device, reducing system cost.

The CS4223 EDC PHY has integrated AC coupling capacitors on all receiver inputs to reduce overall system BOM cost. The device also includes capabilities such as real time eye monitoring, loopbacks, PRBS generators and checkers, hardware interrupt, and GPIO pins for test and debug purposes.

Features

Fully standards compliant:

- IEEE 802.3ba nPPI and nAUI specifications
- IEEE 802.3ap 10Gbase-KR and IEEE 802.3ba 40Gbase-KR4/CR4
- SFF-8431 SFP+ specifications

Wide operating data range:

- 10, 40 GbE, and SONET: 9.983 – 11.3 Gbps
- Fibre Channel: 14.025 Gbps, 8.5 Gbps, 4.25 Gbps, 2.125 Gbps and 1.0625 Gbps
- Infiniband: 14.0625 Gbps, 10 Gbps, 5 Gbps, 2.5 Gbps
- CPRI: 9.983 Gbps, 6.144 Gbps, 4.915 Gbps, 3.072 Gbps, 2.457 Gbps, 1.2288 Gbps, 614 Mbps

Fully symmetric architecture with strong equalization capability:

- Supports SFF-8431 Direct Attach Copper, 40Gbase-CR4, SFP+ ZR, and DWDM

Protocol Support:

- 10Gbase-KR, 40Gbase-KR4/CR4 auto-negotiation, and coefficient training
- Fibre Channel rate negotiation
- High feature integration
 - Integrated 2 × 2 switch for protection switching and broadcast applications
 - Integrated AC coupling capacitors
 - Eye monitoring, PRBS generation and checking, and other debug capabilities

Block Diagram

