

General Description

The HXC42400 is a uni-directional Quad Channel CDR / Retimer for retiming data rates from 25Gbps to 28.05Gbps. It is optimized for 100Gbps Ethernet, OIF CEI-28G-VSR and OTU-4 Optical Transport applications. The HXC42400 can be used in either direction of a transceiver module and can be adopted into QSFP28+, or CFP2/CFP4 modules due to its low 100mW per channel power dissipation. In Bypass operation, the HXC42400 supports legacy data rates up to 16Gbps.

The HXC42400 provides programmable and adaptive equalization in the receiver and programmable de-emphasis in the transmitter to compensate for channel Insertion Loss and ISI. In the receive direction, the programmable / adaptive CTLE provides up to 16dB of equalization and a 1-tap DFE provides additional compensation. In the transmit direction, the programmable, 4-bit, de-emphasis with 3-tap FIR filter provides a 12dB control range.

Auto DC-offset calibration is complemented with auto phase calibration and the unique CDR / Retimer architecture enables independent receive and transmit CDR loop bandwidth optimization for increased Jitter Tolerance and reduced Jitter Transfer performance.

It is able to be used with or without a reference clock with a built-in, single 14GHz master VCO providing the oscillator output for each channel.

Multiple Built in Self-Test (BIST) functions such as a PRBS generator / checker, Jitter Tolerance, Eye Open Monitor, and single lane loopback are supported for module level testing.

The HXC42400 has an I²C interface that is used to set the start-up operating mode for the internal state machine which performs all required calibrations and settings. It is package in a 5x5mm BGA in 9x9 grid of 0.5mm pitch.

Applications

- 100GBASE Ethernet QSFP28 SR4/LR4/ER4 optical modules
- CFP2, CFP4 modules
- Supports OTU4 28Gbps operation for OTL4.4 as defined in ITU Rec G.709
- 128G Fibre Channel modules
- OIF CEI-28G-VSR/LR retimed interface
- N x 25G InfiniBand EDR active optical cables

Features

- Quad 25 - 28Gbps CDR / Retimer
 - Also provides a half-rate mode for 12.5 – 14Gbps operation
- Bypass-mode to support legacy data rate up to 16Gbps
- Programmable 3-tap output de-emphasis for transmit
- Adaptive linear equalizer and decision-feedback equalizer (DFE) to cover up to 16dB lossy channel in receiver
- Low sensitivity of 25mV_{PPD} and adjustable threshold level of data sampler
- Reference-less and Master channel-less operation
- Independent, adaptive bandwidth control in RX CDR for optimum jitter tolerance
- Internal and automatic DC and phase offset calibrations
- On-chip testability; EOM, JTOL, PRBS generator/checker, local/remote loopback,
- Polarity (P/N) inversion
- I²C control interface
- 5x5mm, 1mm – 0.5mm pitch, 81 ball FCBGA

Ordering Information

| Part Number ¹ | Temp Range | Package - # Balls |
|--------------------------|----------------|-------------------|
| HXC42400-xFI | -40°C to +85°C | 5x5mm FCBGA - 81 |
| HXC42400EVB | | |

Note¹ – Where ‘x’ denotes Product Carrier type for shipping

R = Tape and Reel; B = Bulk – Tubes; C = Bulk – Carrier Tray

For price, delivery schedules, and to place orders, please contact IDT: www.IDT.com/go/sales

Device Diagram

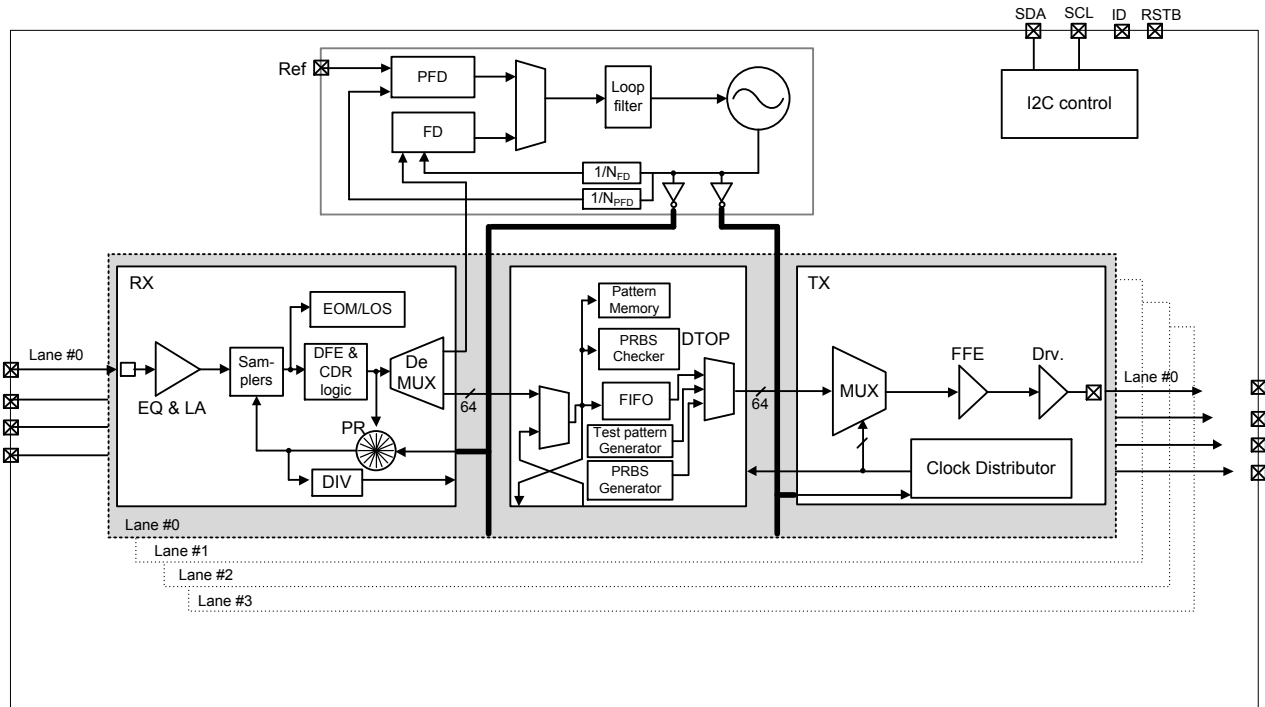


Figure 1: Device Block Diagram

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