



## INTELLIGENT 1/2/4G FIBRE CHANNEL CHANNEL RETIMER/REPEATER WITH EYEOPENER<sup>®</sup>

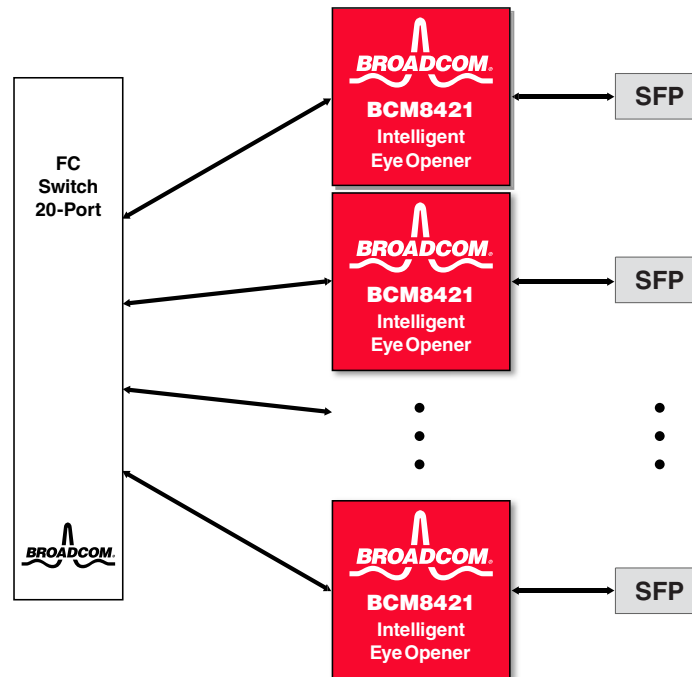
### FEATURES

- Dual EyeOpener<sup>®</sup> exceeding Fibre Channel optical and intercabinet jitter specifications
- Multirate support for new and legacy systems
- Active signal integrity (Active-SD) monitors physical layer and active link integrity (Active-LI) monitors link-layer performance
- Programmable transmit output levels and receive LoS detection
- High-performance receive equalization and programmable transmit pre-emphasis
- Per-channel link LED drivers for valid Fibre Channel frames and speed detection
- Developed using advanced 0.13 $\mu$  CMOS process technology

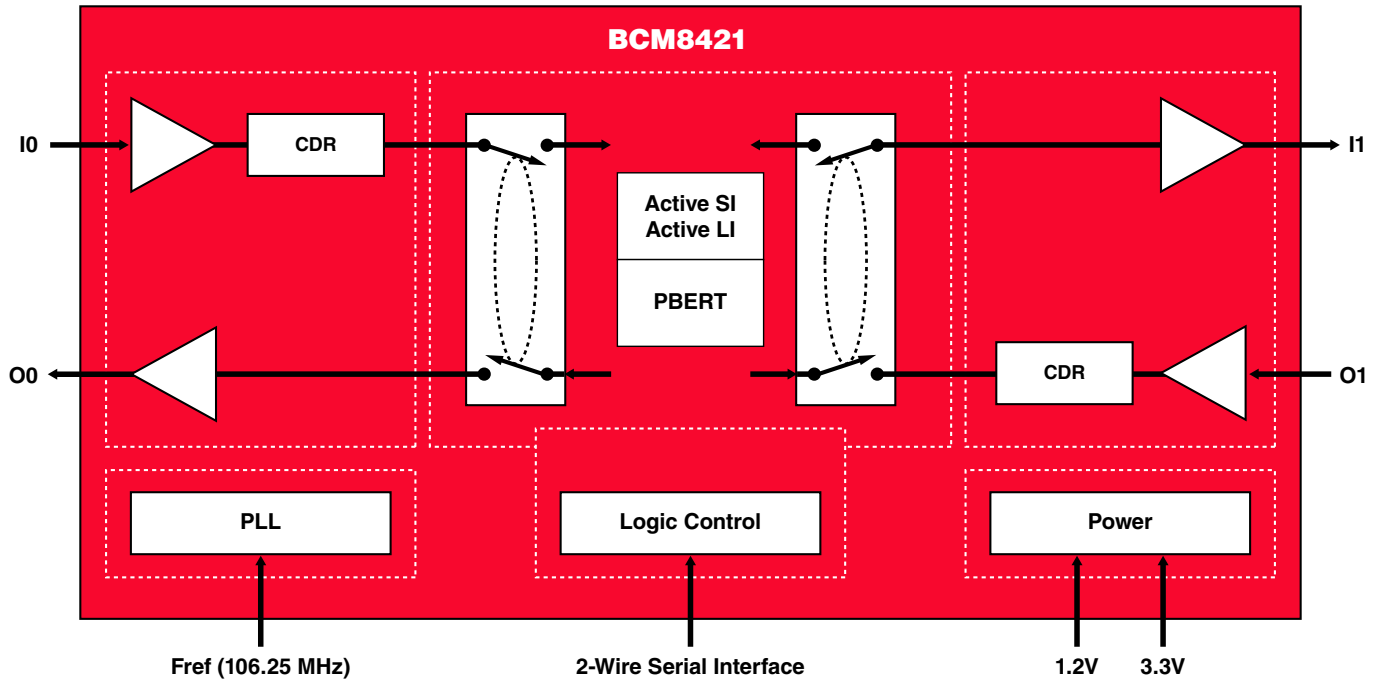
### SUMMARY OF BENEFITS

- Guarantees jitter and bit-error-rate performance on optical and fiber links
- Supports legacy 1.0625-GbE and 2.125-GbE applications and new 4.25-GbE data rates off a single reference clock frequency
- On-chip intelligent diagnostics provides insight to the signal quality with detection and recovery mechanisms on each high-speed link
- Optimizes channel performance for lower power and signal detection through on-chip 2-wire control interface
- Transmits and receives over long distances of copper cables or backplanes with 16 levels of programmable pre-emphasis
- Provides visual indications on PCBs for link status and 1.0625-GbE, 2.125-GbE, or 4.25-GbE data rate transmissions
- Low power design of ~1W with small footprint package in a 13-mm x 13-mm BGA, with 1-mm ball pitch

### Functional Block Diagram



## OVERVIEW



**BCM8421 Block Diagram**

The BCM8421 is a high-performance and low-jitter intelligent retimer/repeater EyeOpener<sup>®</sup> device designed to drive optical and copper ports in Fibre Channel applications. Each port of the BCM8421 can be independently configured as a retimer or a repeater operating at the Fibre Channel data rates of 1.0625 Gbps, 2.125 Gbps, and 4.25 Gbps. With an on-chip low-jitter phase locked loop (PLL), the BCM8421 exceeds Fibre Channel optical and inter-cabinet jitter specifications.

The BCM8421 features Active-SI, which allows monitoring of the received signal at each high-speed port to determine signal eye quality and bit error rate (BER) for system diagnostics, fault isolation, optics aging, and maintenance. An on-chip pattern generator/checker is provided with internal loopback capability on each I/O port.

The BCM8421 also features Active-LI, which is a set of advanced link integrity functions performing data generation and checking transmitted Fibre Channel data. The combination of Active-SI and Active-LI improves storage system's reliability, availability, and serviceability (RAS) with the ability to monitor and diagnose system integrity.

Data from each port can be optionally retimed using an elastic FIFO and local crystal reference clock, eliminating jitter transfer. The BCM8421 can also be configured to operate in repeater mode for low latency.

The BCM8421 is available in a 13-mm x 13-mm BGA package.

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