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BCM8228

PRODUCT Brief

VARIRATE™ MULTIRATE TRANSCEIVER WITH SONET RATE ADAPTATION AND PERFORMANCE MONITORING

FEATURES

- Highly integrated rate-adaptation device that maps a single STS-3/STM-1 or a single STS-12/STM-4 stream into STS-48/STM-16 frames

- Channel-add/channel-extract functionality for mapping and extracting lower SONET rates

- Fully integrated serial clock and data recovery (CDR) 155-Mbps/622-Mbps/2.488-Gbps SONET/SDH transceiver

- Retiming functionality for GbE (SGMII)/FC, (CML)/2xFC, (CML)/ESCON, (CML)/FICON (CML) rates; FE (125 Mbps), DVB (270 Mbps)

- Retiming functionality for STS-3/STM-1, STS-12/STM-4. and STS-48/STM-16 rates (CML)

- MUX/DEMUX functionality for STS-3/STM-1, STS-12/STM-4, and STS-48/STM-16 rates (4-bit LVDS)

- MUX/DEMUX functionality for GbE (TBI)/ESCON (10-bit)/FICON (10-bit)

- Pass-through functionality for other rates (DVB, HDTV etc.)

- Performance monitoring (PM) for SONET with optional section-overhead insertion

- Redundant-receive inputs and transmit outputs to facilitate protection switching designs

- Two-wire/four-wire serial interface for register access and PM count retrieval

- Powers down unused blocks via register access

- PRBS generators and detectors for inbound/outbound SONET and inbound/outbound GbE

- Polarity reversal for differential signals (low and high speed)

- Bit-order swapping for parallel bus (4-bit and 10-bit)

- Exceeds SONET requirements for jitter generation, jitter transfer, and jitter tolerance

- Core supply: 1.8V

- I/O power supplies: CML at 1.8V, CMOS at 1.8V or 3.3V

- Low-power consumption ~1.1W

- Standard CMOS process available in standard 196-pin BGA and Pb-free package
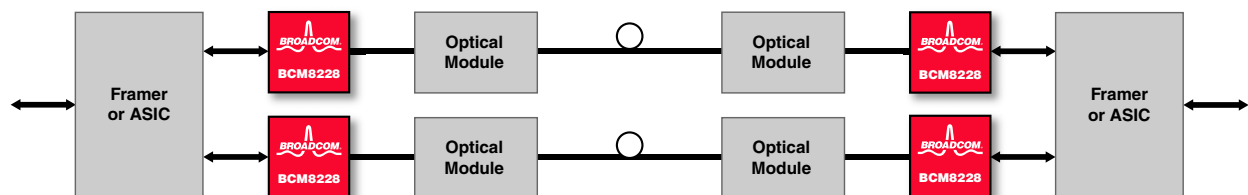
SUMMARY OF BENEFITS

- Compliant with Optical Internetworking Forum (OIF), Telcordia®, ITU-T, and IEEE 802.3 standards

- Reduces design cycle and time-to-market

- Single line-card design supporting rates from FE (125 Mbps) to OC48+FEC (2.7 Gbps)

- Line-side serial interface, with flexible system-side interface supporting SFI-4, TBI, and serial allowing connection to framers, MACs, switches, etc.

- Enables new multirate and multiservice features while retaining existing architectures

- Integrated performance monitoring ensures higher reliability without sacrificing cost or real estate

- High level of integration allows for higher port density solutions

- Bit-order swap allows for ease of PCB design

- Uses the most effective silicon economy of scale for CMOS-based devices

- Low-power consumption eliminates the need for external cooling sources
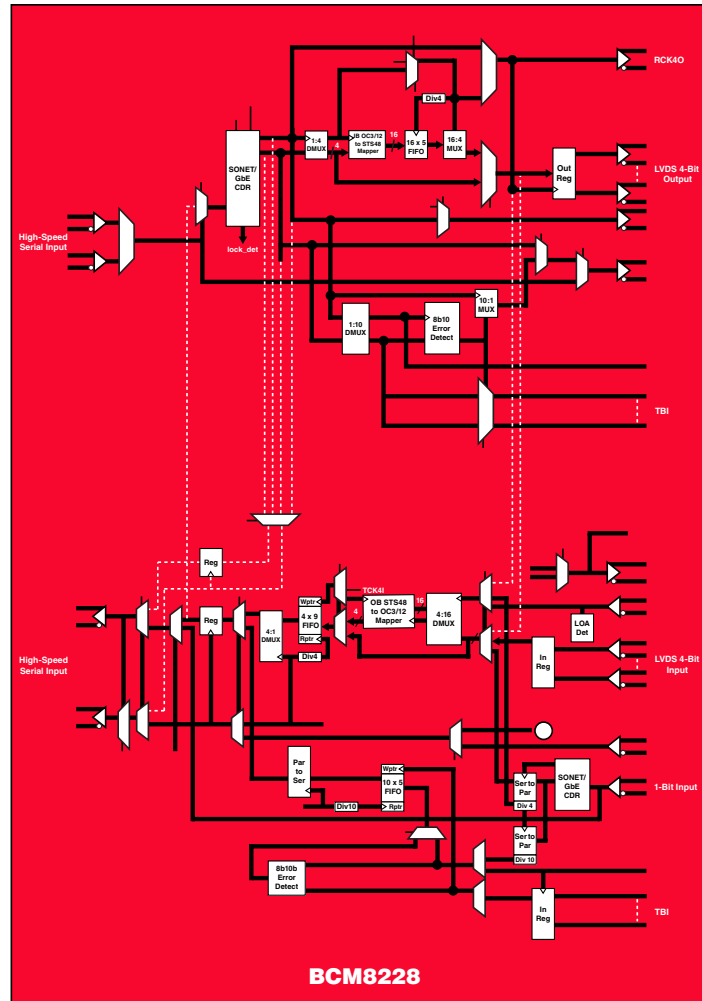
APPLICATIONS

- Multiservice platforms

- Multiple-rate SONET/SDH transmission equipment

- SONET/SDH/GbE/FC multiservice boxes

- ADD/DROP multiplexers

- Optical and digital cross-connects

- SONET test equipment

- Terabit and edge routers

- Repeaters

Application Diagram

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BCM8228 Block Diagram

The BCM8228 VariRate™ device is a highly integrated variable-rate transceiver/mapper operating at STS-48/12/3, GbE, FC/2xFC (Fibre Channel), ESCON, FICON, FE, and DVB data rates. The device has an integrated serial clock and data-recovery (CDR) circuit, loss-of-signal (LOS) detection circuitry as well as an advanced feature set including performance monitoring and a serial interface (2-wire or 4-wire) for register access.

The BCM8228 provides high jitter tolerance and low jitter generation to comply with Optical Internetworking Forum (OIF), IEEE 802.3, Telcordia, ANSI, and ITU-T standards.

The BCM8228 reference clock input frequency is user-selectable to the line rate divided by either 16 or 10. It can be powered with a single 1.8V supply or dual 1.8V/3.3V supply without any special power-supply sequencing requirements. Power consumption of the device is typically 1.1W. The Power-Down Control register turns off any unused blocks.

The BCM8228 is packaged in a 15-mm x 15-mm, 196-pin BGA.

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