

# Broadcom BCM82381 PHY Technology

Connecting everything®



## DUAL 100GbE CAUI4-to-CAUI4 PHY/OCTAL 25G RETIMER

### Overview

The Broadcom® BCM82381 is a low-power, low-latency PHY integrating retimer and equalizer functions that support 100-Gigabit Ethernet (GbE), 40GbE, and 10GbE applications. In 100G mode, the BCM82381 supports two full-duplex 100G ports (CAUI4-to-CAUI4) for SR4, LR4, and copper CR4 CFP2/CFP4/QSFP2 line-card applications. In 40G mode, the BCM82381 supports two full-duplex 40GbE ports (XLPI-to-XLAUI) for SR4, LR4, and copper CR4 QSFP+ line-card applications. In 10G mode, the BCM82381 supports eight full-duplex 10GbE ports (SFI-to-XFI) for SR, LR, and copper CR SFP+ line-card applications.

On-chip clock synthesis is performed by a dual low-cost 156.25 MHz reference clock (for all IEEE Standard 10G/40G/100G rates) via high-frequency, low-jitter phase-locked loops (PLLs). Individual clock recovery is performed on the device by synchronizing directly to the respective incoming data streams.

The BCM82381 was designed in 28 nm CMOS technology to provide a low-power (<2.5W per 100G full-duplex port, including 100G FEC), low-latency (<5 ns round trip) solution with integrated AC coupling capacitors for direct interfacing to Broadcom's switch products.

The BCM82381 is available in a 19 mm x 19 mm, 324-pin BGA, RoHS-compliant package.

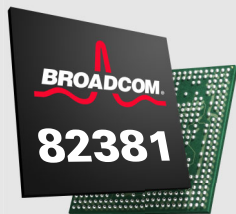
### Features

- Dual 100GbE ports with CAUI4-to-CAUI4 port support SR4/LR4/CR4 CFP2/CFP4/QSFP2 retimer/equalization applications.
- Dual 40GbE channels with two XLPI-to-XLAUI ports support SR4/LR4/CR4 QSFP+ retimer/equalization applications.
- 10G mode with eight independent 10GbE/1GbE SFI-to-XFI channels support SR/LR/CR SFP+ retimer/equalization applications. Supports an intermix of 1GbE and 10GbE operations on a per-lane basis.
- Low-latency design (<5 ns round trip).

- Low-power retimer/equalizer PHY (<2.5W per 100GbE bidirectional port, including 100G FEC; equivalent to <300 mW per 25G unidirectional channel for 25G retiming mode).
- Seamless high-speed I/O routing to modules.
- Integrated AC-coupling capacitors on all high-speed receivers.
- High-performance receive equalization ~30 dB at system side and ~35 dB at line side for channel loss.
- Programmable transmit preemphasis for flexible PHY placement.
- IEEE 802.3bj 100GbE CR4 Clause 92 transmit training; IEEE 802.3ba 40GbE CR4 Clause 85 transmit training.
- Supports IEEE 802.3bj Clause 91 Forward Error Correction (FEC) and bypassable.
- Supports Fibre Channel rates: 32G/16G/8G/4G FC.
- Supports individual 25G lane retiming mode.
- Line-side and system-side loopbacks.
- Single low-cost 156.25 MHz reference clock.
- Standard two-wire serial interface (BSC) support for external modules.
- Low-speed module I/O control signals for CFP2, CFP4, and QSFP2.
- MDIO interface compliant with IEEE 802.3ae Clause 45 with extended indirect address register access.
- Advanced diagnostics, including eye-mapping and BER with PRBS generators/checkers.
- Dual-supply operation—1.0V/3.3V.

### Applications

- High-density line cards support 100GbE CAUI4-to-CAUI4, 40GbE XLPI-to-XLAUI, and 10GbE SFI-to-XFI
- 100GbE CFP2/CFP4/QSFP2 optical and copper interfaces support SR4, LR4, and copper CR4
- 40GbE QSFP+ optical and copper interfaces support SR4, LR4, and copper CR4
- 10GbE SFP+ optical and interfaces support SR, LR, and CR application

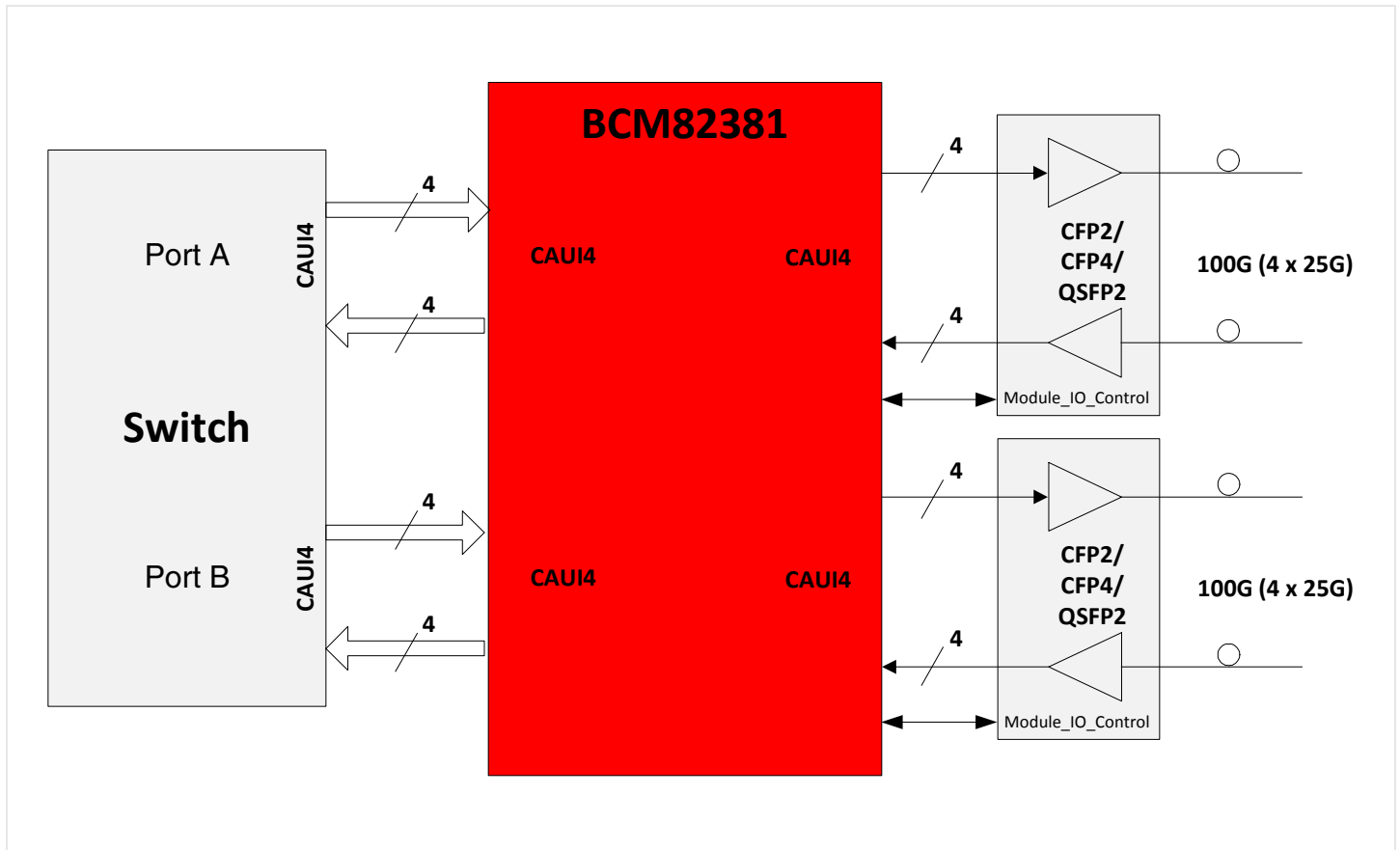


### Highlights

- IEEE 802.3bj, 802.3ba standard-compliant device
- Dual 100GbE ports with CAUI4-to-CAUI4 port support SR4/LR4/CR4 CFP2/CFP4/QSFP2 retimer/equalization applications
- Octal 25G retimer mode
- Supports 32G/16G/8G/4G Fibre Channel rates
- Low-power 28 nm CMOS

	BCM82380
Service Provider	●
OTN/PTN	◐
Data Centers	●
Enterprise	●

◐ Supported ● Best Choice



Functional Block Diagram

**Ordering Information**

**Part Number**

Dual 100GbE CAUI4-to-CAUI4 PHY/Octal 25G Retimer

BCM82381

**About Broadcom**

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office, and mobile environments. With the industry's broadest portfolio of state-of-the-art system-on-a-chip and embedded software solutions, Broadcom is changing the world by Connecting everything®. For more information, go to [www.broadcom.com](http://www.broadcom.com).





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