

## Key Features

- Dual 100GbE port with CAUI4-to-CAUI4 port supports SR4/LR4/CR4 CFP2/CFP4/QSFP28 retimer/equalization/MACsec encryption
- Dual 40GbE channels with two XLPPI-to-XLAUI ports support SR4/LR4/CR4 QSFP+ retimer/equalization/MACsec encryption
- 10G mode with eight independent 10GbE SFI-to-XFI channels supports SR/LR/CR retimer/equalization/MACsec encryption
- 25G mode with eight independent 25G channels for SFP28
- MACsec encryption in 2× 20G and 4× 10G modes
- Supports IEEE 1588 timestamping as well as ITU-T Y.1731 with Synchronous Ethernet (SyncE) recovered clock outputs
- Supports IEEE 802.3bj 100GbE CR4 Clause 92 transmit training and IEEE 802.3ba 40GbE CR4 Clause 85 transmit training
- Supports 100G IEEE 802.3bj CL91 FEC and 25G IEEE 802.3by CL74/CL108
- MDC/MDIO host interface with 1.8V/3.3V operation

# BCM82391

## 28-nm Dual 100G MACsec Retimer PHY

### Description

The Broadcom BCM82391 is a low-power, high-density PHY integrating IEEE 802.1AE MACsec GCM-AES-256b encryption, IEEE 1588, retimer, and equalizer functions supporting 100-Gigabit Ethernet (100GbE), 50GbE, 40GbE, 25GbE, and 10GbE applications. In 100G mode, the BCM82391 supports two full-duplex 100G ports (CAUI4-to-CAUI4) for SR4, LR4, ER4, and copper CR4 CFP2/CFP4/QSFP28 line-card applications. In 40G mode, the BCM82391 supports two full-duplex 40GbE ports (XLPPI-to-XLAUI) for SR4, LR4, and copper CR4 QSFP+ line-card applications. In 10G mode, the BCM82391 supports eight full-duplex 10GbE ports (SFI-to-XFI) for SR, LR, and copper CR line-card applications.

On-chip clock synthesis is performed by a single 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 BCM82391 is designed in 28-nm CMOS technology to provide a low-power solution with integrated AC-coupling capacitors for direct interfacing to Broadcom switch products.

The BCM82391 is footprint compatible with the BCM82381 and is available in a 19-mm × 19-mm, 324-pin BGA, RoHS-compliant package.

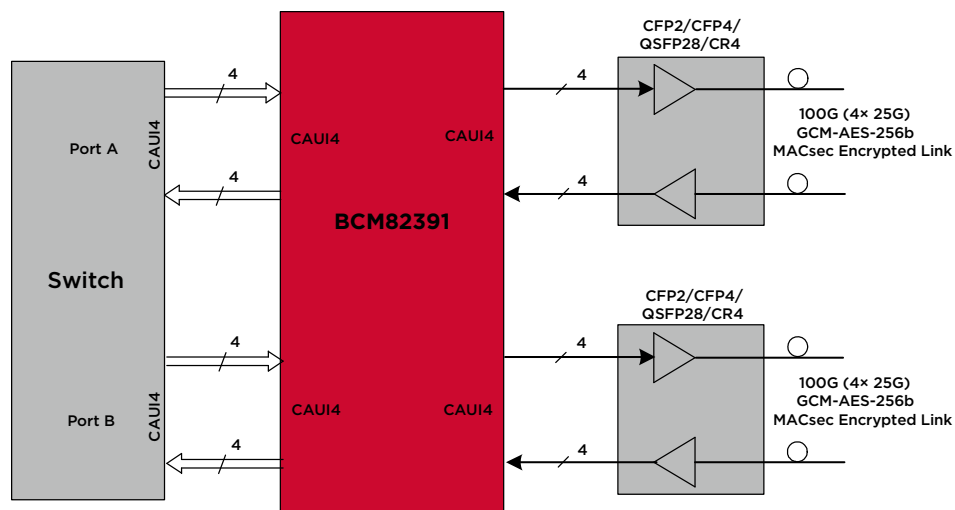
### Applications

- Supports IEEE 802.1AE (dataplane) and IEEE 802.1AEbw-2013, including GCM-AES-128 and GCM-AES-256
- Supports 10G/25G/40G/50G/100G Ethernet applications
- MACsec encryption on high-density line/fabric 10G/25G/40G/100G Ethernet cards

## Key Features (con't)

- Integrated AC-coupling capacitors on all high-speed receivers
- Dual supply—1.0V and 1.8V/2.5V/3.3V
- Footprint compatible with BCM82381 CDR/retimer
- 19-mm × 19-mm BGA package, 1-mm ball pitch

Figure 1: BCM82391 Block Diagram



## Ordering Information

19 mm × 19 mm, 324-pin BGA, RoHS compliant

BCM82391AKFSBG