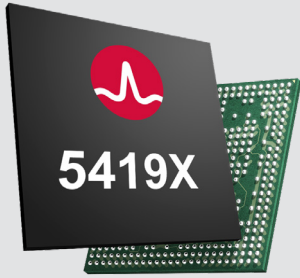


Product Brief



Key Features

- SGMII interface (BCM54190/BCM54194 only)
- QSGMII interface (BCM54192/BCM54194/BCM54195 only)
- IEEE 802.1AE-compliant
- Support for the following copper line interfaces: 1000BASE-T, 100BASE-TX, and 10BASE-T
- Support for the following fiber line interfaces (BCM54140/BCM54185 only): 1000BASE-X, 100BASE-FX, and SGMII-Slave
- MACsec features:
 - AES/GCM 128/256 bit encryption/decryption
 - Storage for 2 or 4 keys per security association (SA) for seamless transfer
 - Replay protection
 - 48-bit and 64-bit MIB counters per IEEE 802.1AE
 - Priority flow control (PFC) packet support
- Energy Efficient Ethernet (EEE) IEEE 802.3az
 - Support for native EEE MACs
- Support for legacy non-EEE MACs using AutogrEEEn® mode

BCM5419X

Quad and Octal Gigabit Ethernet Transceiver with MACsec

Overview

The Broadcom® BCM5419X is a fully integrated quad (BCM54194) and octal (BCM54190, BCM54192, and BCM54195) gigabit transceiver family with standard compliant IEEE 802.1AE MACsec functionality on all ports. These devices are intended to provide a link security solution for both future and predecessor switching silicon that exceeds the requirements of IEEE 802.1AE MACsec standards. The BCM5419X family supports both controlled MACsec-encrypted frames and uncontrolled frames.

The PHY performs all of the physical layer functions on standard Category 5 UTP cable for 10BASE-T, 100BASE-TX, and 1000BASE-T. When in Fiber mode, the PHY performs all the other physical layer functions for 100BASE-FX, 1000BASE-X, and SGMII-Slave.

The BCM5419X is based on the proven digital-signal processor technology from Broadcom, combining digital adaptive equalizers, ADCs, phase-locked loops, line drivers, encoders, decoders, echo cancelers, crosstalk cancelers, and all other required support circuitry integrated into a single, monolithic CMOS chip.

Designed for reliable operation over worst-case Category 5 cable plants, the BCM5419X device family automatically negotiates with any transceiver on the opposite end of the wire to agree on an operating speed. The PHY can also evaluate the condition of the twisted-pair wiring to ensure that the wiring can support operation at gigabit speeds, and detect and correct most common wiring problems. The device continually monitors both the wiring and the opposing transceiver and alerts the system if it detects potential problems with reliable operation.

Benefits

- The industry's first 28-nm MACsec gigabit PHY with low power consumption and Energy Efficient Ethernet that enhances the thermal performance and reduces system operating cost
- Comprehensive IEEE 1588 PTP feature set provides accurate timing synchronization and minimizes CPU intervention for timestamping
- Pin-to-pin compatible to Broadcom BCM5418X gigabit PHYs
- AES/GCM 128/256-bit encryption/decryption for the most robust security protocol

Applications

- High-density gigabit Ethernet switches and routers
- Industrial Ethernet

Key Features (con't)

- IEEE 1588v2-compliant:
 - One-step or two-step clock
 - On-chip timestamping
- ITU-T Y.1731 delay measurement support:
 - On-chip timestamping
 - One-way and two-way in both directions
- Synchronous Ethernet support
- Ethernet@WireSpeed™
- Cable plant diagnostics that detect cable plant impairments
- Wake-on-LAN (WoL)
- Line-side and switch-side loopbacks
- Voltage and temperature monitors
- Programmable LEDs
- Robust Cable ESD (CESD) tolerance
- Low EMI emissions
- IEEE 1149.1 and IEEE 1149.6 boundary scan

Ordering Information

Part Number	Package	Ambient Temperature
BCM54190B0KFBG	400-Ball FBGA (RoHS-compliant)	0°C to 70°C
BCM54192B0KQLEG	128-Pin eLQFP (RoHS-compliant)	0°C to 70°C
BCM54194B0KFBG	256-Ball FBGA (RoHS-compliant)	0°C to 70°C
BCM54194B0IFBG	256-Ball FBGA (RoHS-compliant)	-40°C to 85°C
BCM54195B0KFBG	400-Ball FBGA (RoHS-compliant)	0°C to 70°C

Figure 1: BCM54190 Block Diagram

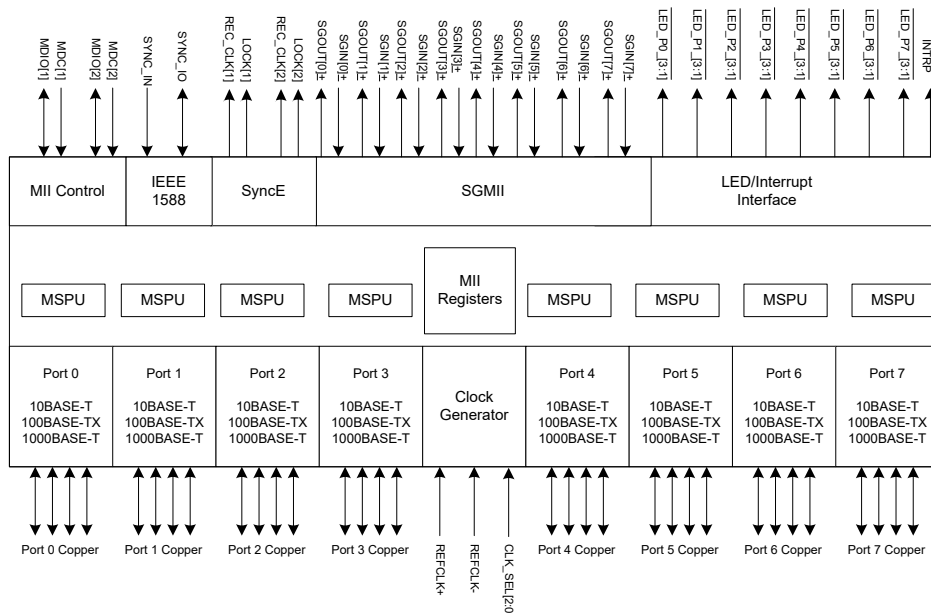


Figure 2: BCM54192 Block Diagram

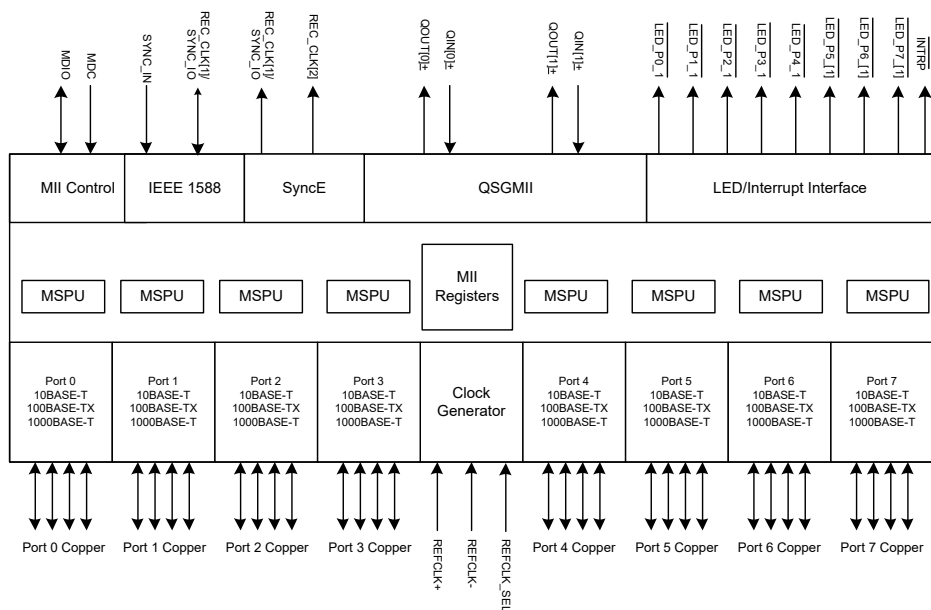


Figure 3: BCM54194 Block Diagram

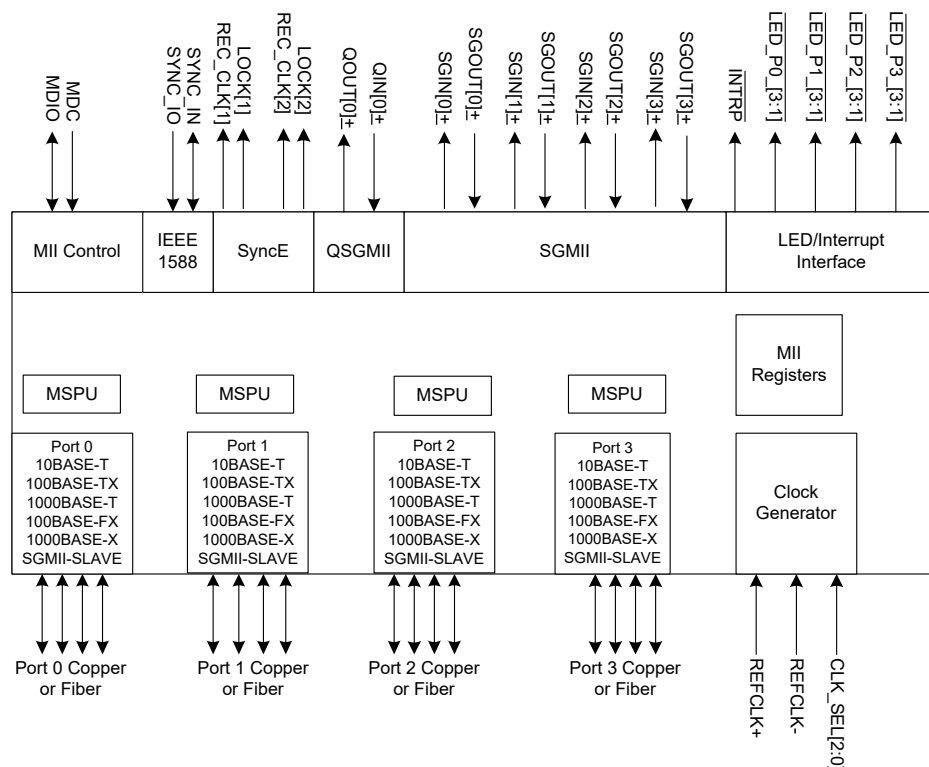


Figure 4: BCM54195 Block Diagram

