BROADCOM®

Product Brief

BCM5418X

Quad and Octal Gigabit Ethernet Transceiver

Overview

The Broadcom® BCM5418X is a fully integrated quad (BCM54140) and octal (BCM54180, BCM54182, and BCM54185) gigabit transceiver family. 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 physical layer functions for 100BASE-FX, 1000BASE-X, and SGMII-Slave (BCM54140/BCM54185 only).

The BCM5418X device family is based on 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 the other required support circuitry integrated into a single, monolithic CMOS chip.

Designed for reliable operation over worst-case Category 5 cable plants, a BCM5418X device 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 gigabit PHY with low power consumption and Energy Efficient Ethernet that enhances thermal performance and reduces the system operating cost
- Comprehensive IEEE 1588 PTP feature set provides accurate timing synchronization and minimizes CPU intervention for the timestamping
- Pin-to-pin compatible to Broadcom BCM5419X MACsec gigabit PHYs

Applications

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

Key Features

- SGMII interface (BCM54140/ BCM54180 only)
- QSGMII interface (BCM54140/ BCM54182/BCM54185 only)
- Support for the following copper line interfaces: 1000BASE-T, 100BASE-TX, and 10BASE-T
- Support for the following fiber line interfaces: 1000BASE-X, 100BASE-FX, and SGMII-Slave (BCM54140/ BCM54185 only)
- Energy Efficient Ethernet (EEE) IEEE 802.3az
  - Support for native EEE MACs
  - Support for legacy non-EEE MACs using AutogrEEEn® mode
- IEEE 1588v2-compliant
  - One-step or two-step clock
  - On-chip timestamping
- ITU-T Y.1731 delay measurement support
  - On-chip time stamping
  - One-way and two-way in both directions
- Synchronous Ethernet support
- Ethernet@WireSpeed™
- Cable plant diagnostics that detect cable plant impairments

Key Features (con't)

- 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

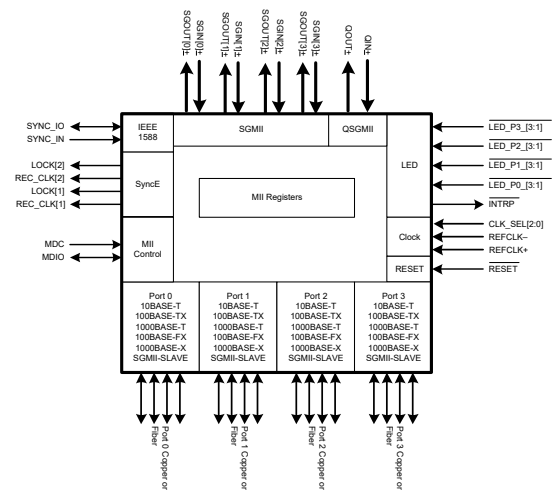| Part Number	Package	Ambient Temperature
BCM54140B0KFBG	256-Ball FBGA (RoHS-compliant)	0°C to 70°C
BCM54140B0IFBG	256-Ball FBGA (RoHS-compliant)	–40°C to 85°C
BCM54180B0KFBG	400-Ball FBGA (RoHS-compliant)	0°C to 70°C
BCM54180B0IFBG	400-Ball FBGA (RoHS-compliant)	–40°C to 85°C
BCM54182B0KQLEG	128-Pin eLQFP (RoHS-compliant)	0°C to 70°C
BCM54182B0IQLEG	128-Pin eLQFP (RoHS-compliant)	–40°C to 85°C
BCM54185B0KFBG	400-Ball FBGA (RoHS-compliant)	0°C to 70°C
BCM54185B0IFBG	400-Ball FBGA (RoHS-compliant)	–40°C to 85°C

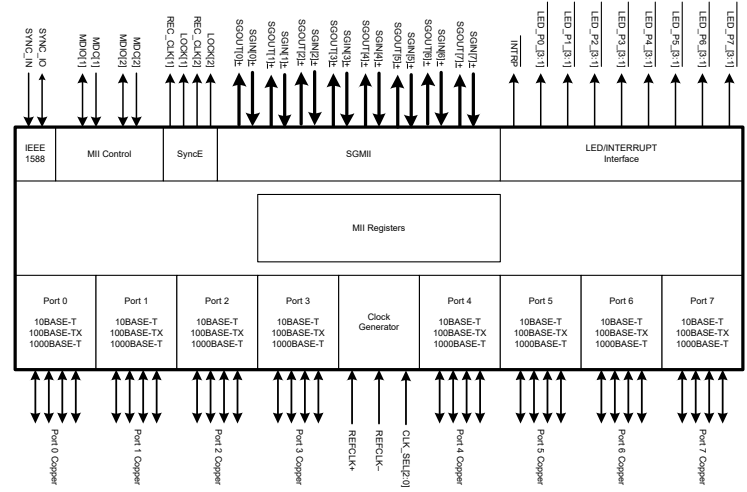Figure 1: BCM54140 Block Diagram

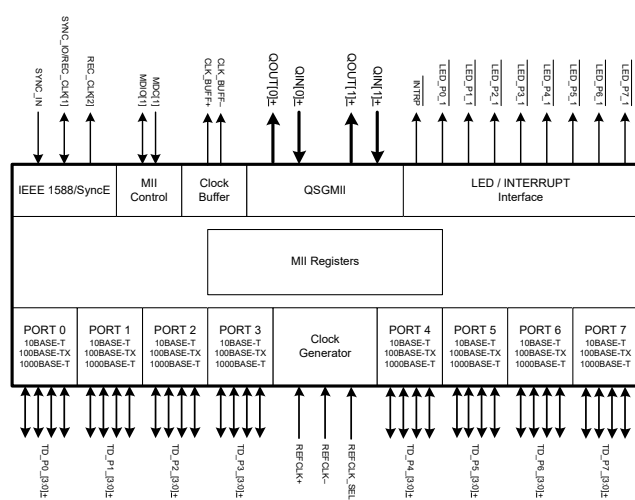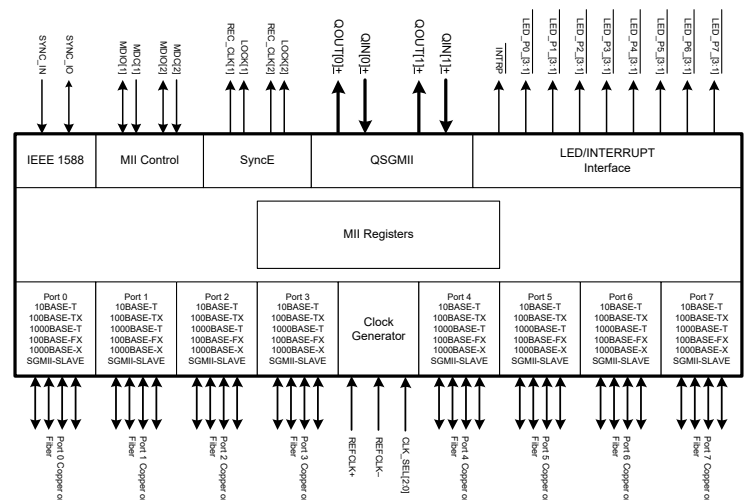Figure 2: BCM54180 Block Diagram

Figure 3: BCM54182 Block Diagram

Figure 4: BCM54185 Block Diagram

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VSC7421XJQ-02 VSC8522XJQ-02 LAN91C93I-MU VSC7389XHO 78Q2133S/F BCM54210EB1IMLG BCM54220B0KFBG
BCM5720A0KFBG BCM54210SB0IMLG MAX3956AETJ+ KSZ8441FHLI BCM5396IFBG BCM54640EB2IFBG BCM5461SA1KPFG
BCM53402A0IFSBG KSZ8091MNXCA JL82599ES S R1VN BCM53125MIMMLG VSC7440XMT VSC7513XKS VSC7514XKS
VSC7432YIH-01 WGI219V SLKJ5 BCM84793A1KFSBG BCM56680B1KFSBLG 88E3082-C1-BAR1C000 WGI210CS S LKKL
BCM56450B1IFSBG BCM56960B1KFSBG EZX557AT2 S LKVX FTXXV710-AM1 S LLZ2 BCM56860A1KFSBG BCM56842A1KFTBG
 BCM56450B1KFSBG BCM53405A0KFSBG EZX557AT S LKW4 EZX557AT4 S LKVZ