QCA8075 Five-Port 10/100/1000 Mbps Ethernet Transceiver

QCA8075 Product Overview

The QCA8075 Ethernet transceiver is a 5-port, 10/100/1000 Mbps tri-speed Ethernet PHY. The QCA8075 Ethernet transceiver provides physical layer functions for half/full-duplex 10BASE-Te, 100BASE-TX, and full-duplex 1000BASE-T Ethernet to transmit and receive data over standard Category 5 (CAT-5) unshielded twisted pair cable.

The QCA8075 includes two SerDes. One can be configured to PSGMII or QSGMII for connection with MAC. The other can be configured to SGMII for connection with MAC or fiber port combined with copper port1 to form a combo port.

The QCA8075 Ethernet transceiver integrates Green ETHOS® power saving technologies which significantly save power in both active operation and idle condition. Green ETHOS® power saving schemes include ultra-low power in cable unplugged mode or port power down mode, as well as automatically optimized power saving based on cable length. The QCA8075 Ethernet transceiver supports standard IEEE 802.3az Energy Efficient Ethernet (EEE) and furthermore the Wake-on-LAN (WoL) feature to manage and regulate total system power requirements.

The key features of the IEEE 802.3az standard include:

- o 10BASE-Te: Reduced transmit amplitude
- o 100BASE-TX and 1000BASE-T: Low Power Idle (LPI) mode to turn off unused analog and digital blocks to save power when data traffic is idle

The QCA8075 Ethernet transceiver embeds Cable Diagnostics Test (CDT) technology for measuring cable length, detecting the cable status, and identifying remote and local PHY malfunctions, bad or marginal patch cord segments or connectors.

The QCA8075 Ethernet transceiver requires only a single 3.3 V power supply. Embedded regulators are used to generate other required voltages.
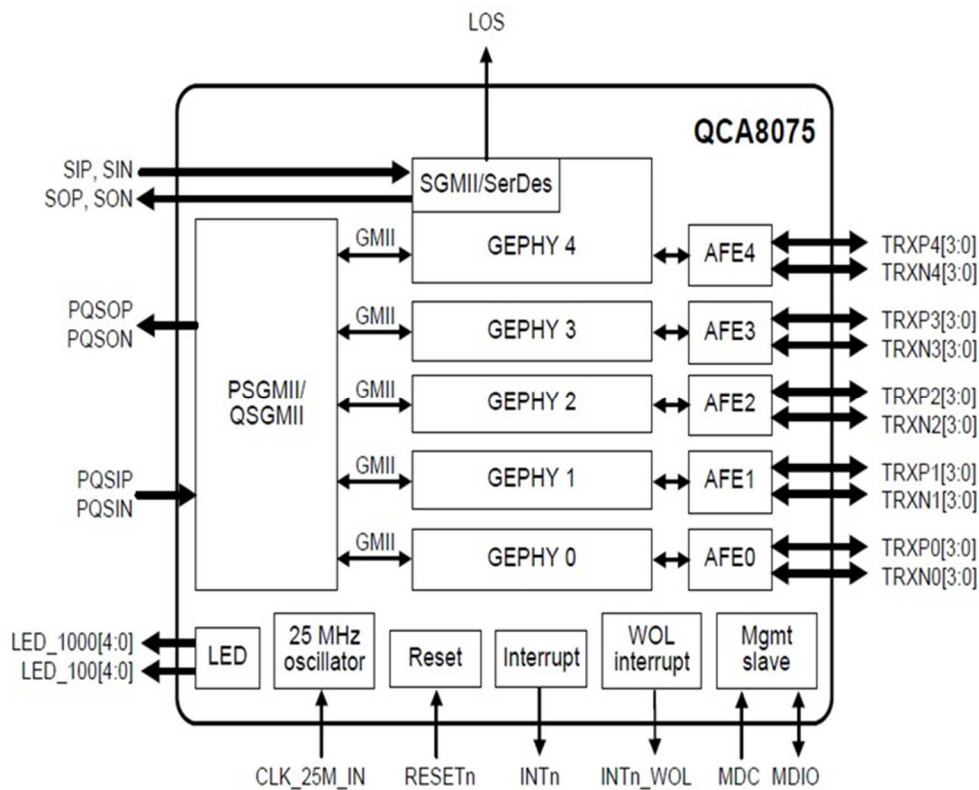
Solution Highlights & Specifications

- Supports three working modes with power-on strapping configuration:
  - o Five 1000BASE-T/100BASE-TX/10BASE-Te ports with PSGMII to MAC
  - o Four 1000BASE-T/100BASE-TX/10BASE-Te port and one combo port (fiber/copper)with PSGMII to MAC
  - o Five 1000BASE-T/100BASE-TX/10BASE-Te ports with QSGMII and SGMII to MAC
- The combo port supports auto media detection with programmable priority
- The fiber port supports 1000BASE-X/100BASE-FX
- Management interface (MDIO) supports broadcast write
- CRC checker and packet counter
- Green ETHOS® power saving modes:
  - o Automatic power saving at media disconnected state
  - o Automatic power saving per cable length
  - o Software power down
- IEEE 802.3az EEE
- Wake-on-LAN (WoL) to detect magic packet and notify the sleeping system to wake up
- Fully integrated digital adaptive equalizers, echo cancellers, and Near End Crosstalk (NEXT)

cancellers

- Robust Contact Electro-Static Discharge (ESD) protection without external protection circuit
- Robust Lightening Surge performance without external protection circuit
- Robust operation over up to 140 meters of CAT5e cable
- Automatic Channel Swap (ACS)
- Automatic MDI/MDIX crossover
- Automatic polarity correction
- IEEE 802.3u compliant auto-negotiation
- Jumbo frame support up to 9 KB (full-duplex)
- Management interface supports 1.5/1.8/2.5/3.3 V I/O voltage.
- 25 MHz single-ended clock input
- Multiple loopback modes for diagnostics
- Cable Diagnostic Test (CDT)
- Single power supply: 3.3 V, optional for internal switch regulator or external regulator for core voltage
- 9 mm × 9 mm, 108-pin DR-QFN package
- Industry temperature option available
- Heatsink-free design for commercial temperature part

QCA8075 System Architecture

Qualcomm ETHOS

Qualcomm ETHOS technologies provide customers with industry-leading low-power and solution size to enable Fast or Gigabit Ethernet connectivity in networking equipment, consumer electronics and computing platforms. Qualcomm PHY, controller and switch solutions support the IEEE 802.3az standard for Energy Efficient Ethernet, to extend battery-charges on computing platforms and deliver power-efficiencies in networking equipment. Qualcomm also enables incremental power-saving techniques to offer our customers the very lowest power Ethernet in the industry today. The unmatched efficiency and advanced carrier-class features of Qualcomm ETHOS solutions give customers a competitive edge when designing products for energy-conscious consumers and businesses.