



## PRODUCT OVERVIEW

The Marvell® Alaska® family of Gigabit Ethernet (GbE) over copper transceivers are the industry's lowest power, smallest form factor, highest performance, and highest port density solutions in volume production. Targeted at high-density GbE switches, the Alaska Quad transceivers are single-chip devices containing four independent GbE PHYs on a single monolithic IC. Each transceiver performs all of the physical layer functions for 100BASE-TX and 1000BASE-T full or half duplex Ethernet on category 5 (CAT 5) twisted pair cable, and 10BASE-T full or half duplex Ethernet on CAT 3, 4 and 5 cable. The Alaska Quad devices (88E1040S, 88E1041S and 88E1042H) offer additional support of 1000BASE-X through an integrated 1.25 GHz Serializer/Deserializer (SERDES).

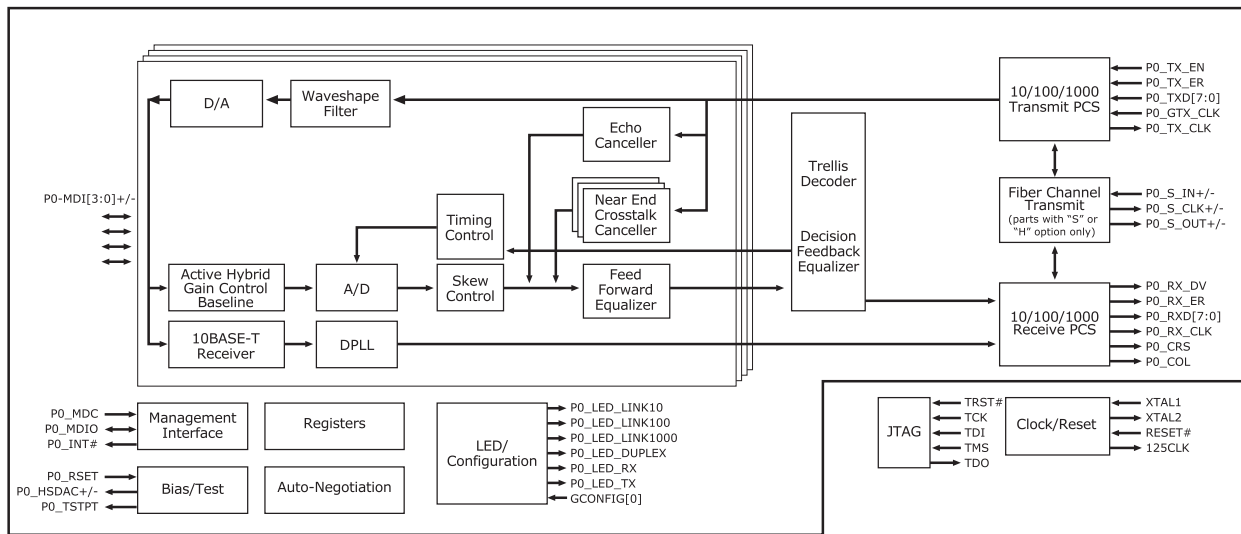


Fig 1. Alaska Quad GbE Transceiver Block Diagram

## FEATURES

- Highly integrated 4-port device
- Ultra low power, just exceeding 1W/port
- 10/100/1000BASE-T IEEE 802.3 compliant
- Supports GMII/RGMII/TBI/RTBI interfaces
- Virtual Cable Tester™ feature
- Integrated 1.25 GHz SERDES (88E1040S, 88E1041S, 88E1042H)
- Media Detect feature automatically detects and configures to either copper or fiber media
- Automatic support for 2-pair CAT 5 cable (100 Mbps)
- Power management modes
- Four RGMII timing modes
- User configurable independent Media Access Controller (MAC) interface select

## BENEFITS

- Enables highly integrated Gigabit switches
- Enables higher integration and reduced cost
- Compatibility with existing installed base of compliant devices
- Reduces cost and simplifies PCB layout
- Remote cable diagnostics for fault detection
- Supports 1000BASE-X fiber applications
- Complete media flexibility
- Operates over installed 2-pair cable
- Reduced system power
- Eliminate the need for on-board delay lines
- Allows interface flexibility





## FEATURES

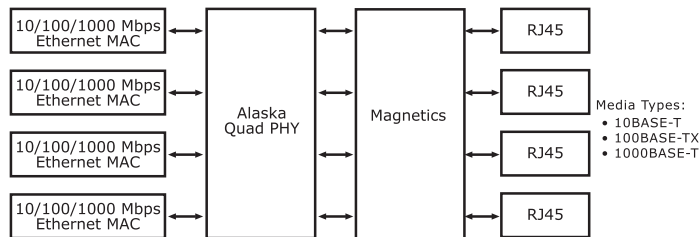
- User programmable individual/group MDC/MDIO support
- Auto-MDI/MDIX crossover for all modes of operation
- Support IEEE 1149.1 (JTAG) and NAND-tree ICT
- Advanced mixed-signal and DSP techniques
- IEEE 802.3u compliant Auto-Negotiation
- Active internal hybrids for 1000BASE-T
- Direct drive LED support
- Software configurable LED support
- User programmable PHY address
- Loopback mode
- 0.15-micron standard digital CMOS process

## BENEFITS

- Flexible management options
- Eases installation and reduces cost
- Simplifies board level testing/debugging
- Advanced DSP design
- Automatically configures to 10, 100 or 1000 Mbps
- Lower cost magnetic
- Eliminates cost of external LED latches and drivers
- User-defined LED configuration
- Works with all existing Gigabit switch designs
- Assists testing and diagnostics
- Advanced process for reduced power and cost to achieve the highest port density

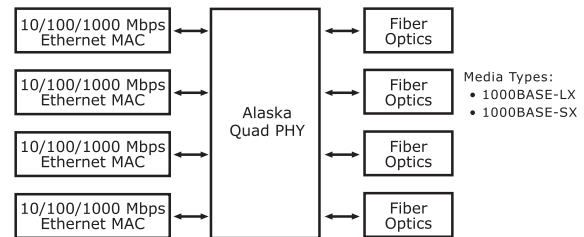
## APPLICATIONS

The Marvell Alaska Quad GbE transceivers provide higher port count Gigabit switches, up to 48 ports, offering the industry's highest integration and lowest power dissipation. Through integrated SERDES technology, the devices also offer optional support for 1000BASE-SX/LX Gigabit fiber standards, on a per port basis, enabling mixed-media Gigabit switches. These devices support five different PHY/MAC interface options: GMII, RGMII, SGMII, TBI, and RTBI.



- MAC Interface Options:
- GMII/MII (88E1040/88E1040S and 88E1041/88E1041S only)
  - TBI (88E1040/88E1040S and 88E1041/88E1041S only)
  - RGMII
  - RTBI
  - SGMII
  - Serial Interface (88E1040S, 88E1041S and 88E1042H only)

Fig 2. Alaska Quad GbE Transceiver Copper Application Diagram



- MAC Interface Options:
- GMII/MII (88E1040S and 88E1041S only)
  - TBI (88E1040S and 88E1041S only)
  - RGMII
  - RTBI

Fig 3. Alaska Quad GbE Transceiver Fiber Application Diagram

**THE MARVELL ADVANTAGE:** The Marvell Alaska Quad GbE transceivers come with a complete set of hardware and software development tools to assist network hardware engineers with product evaluation. Marvell's worldwide field applications engineers collaborate closely with network equipment vendors to develop and deliver new competitive products to market on time. Marvell utilizes recognized world-leading semiconductor foundry and packaging services to reliably deliver high-volume and low cost total solutions.

For more information, visit our website at [www.marvell.com](http://www.marvell.com).



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100207-001 04/02