

# Marvell® 88E1780 Octal-Port 1GbE copper PHY

Integrated Octal Ports 10/100/1000 Mbps Energy Efficient Ethernet Transceiver with USGMII Interface

## Overview

The latest generation Alaska® family of single-chip devices contains eight independent Gigabit Ethernet transceivers on a single monolithic IC. Each transceiver performs all the physical layer functions for 1000BASE-T and 100BASE-TX full or half-duplex Ethernet on CAT5 twisted pair cable, and 10BASE-T full or half-duplex Ethernet on CAT 3, 4, and 5 cable.

The Alaska device supports the Universal Serial Gigabit Media Independent Interface (USGMII) for direct connection to a MAC/Switch port. The USGMII combines eight ports of SGMII running at 1.25 Gbps onto a single differential-pair of signals operating at 10 Gbps. USGMII primarily decreases the number of I/O pins on the MAC interface compared to SGMII and lowers the overall power consumption. The device supports one USGMII port to connect the eight copper ports to the MAC device.

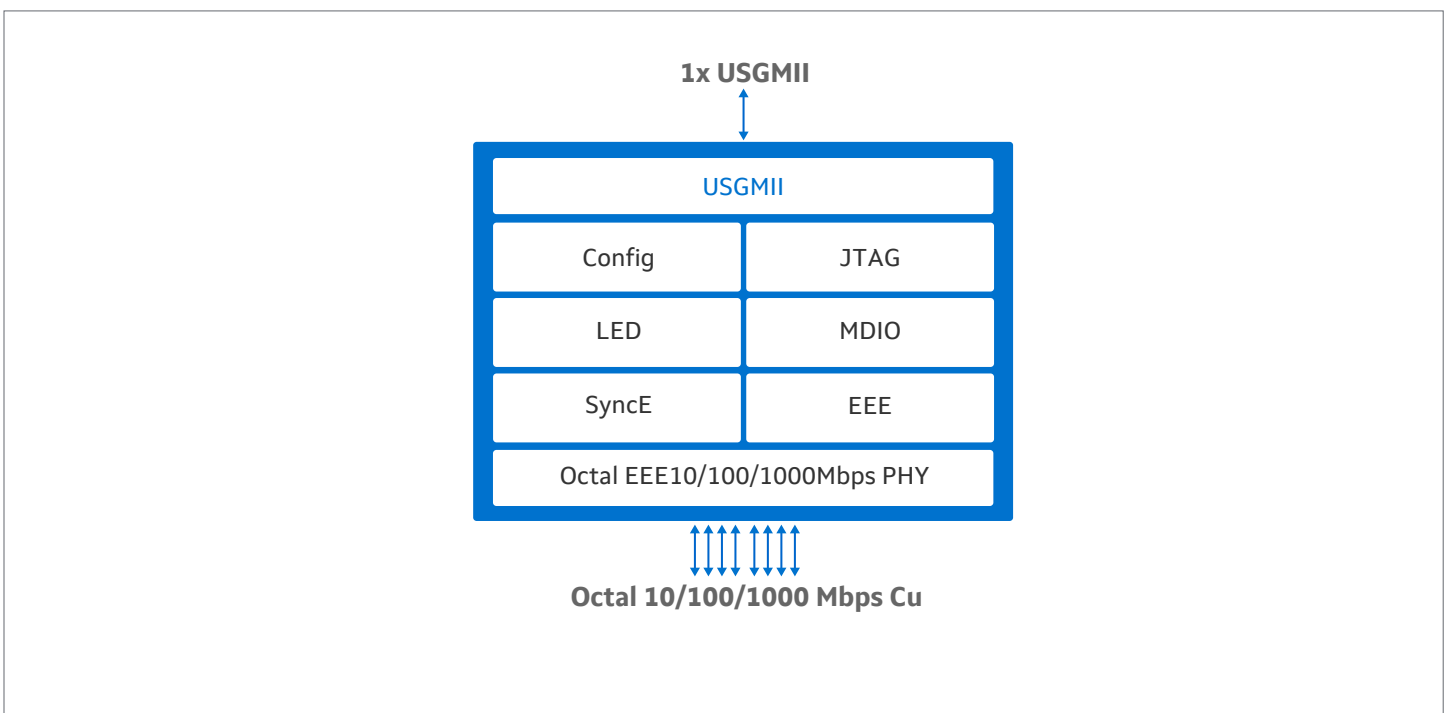
The device supports IEEE 802.3az Energy Efficient Ethernet (EEE) and is IEEE 802.3az compliant.

The device integrates MDI interface termination resistors and capacitors into the PHY. This resistor integration simplifies board layout and lowers board cost by reducing the number of external components. The new Marvell calibrated resistor scheme will achieve and exceed the accuracy requirements of the IEEE 802.3 return loss specifications. The device consumes ultra-low power. This reduces the overall system cost by eliminating heat-sink and reducing air-flow requirements.

The device supports Auto-MDI/MDIX at all three speeds to enable easier installation and reduces installation costs.

The device also supports integrated Advanced Virtual Cable Tester® (VCT™) enabling fault detection and advanced cable performance monitoring.

## Block Diagram



## Key Features

| Features                    | Benefits  |
|-----------------------------|---|
| Media port speed            | <ul style="list-style-type: none"><li>8-port, 3-speed PHY, operating at 10, 100 Mbps, or 1Gbps data rates on UTP copper lines</li><li>Fully compliant with IEEE 802.3 standard</li></ul>                          |
| Host Interfaces             | <ul style="list-style-type: none"><li>Single USGMII (10G) which combines eight ports of SGMII onto a single Serdes</li></ul>  |
| Diagnostic                  | <ul style="list-style-type: none"><li>Integrated Advanced Virtual Cable Tester® (VCT™)</li><li>Temperature sensor</li><li>Voltage Monitor</li><li>Various loopback modes</li></ul>                                |
| Time stamping               | <ul style="list-style-type: none"><li>Synchronous Ethernet (SyncE) for 1000BASE-T and 100BASE-TX</li><li>Time stamping through a Packet Control Header (PCH), which complies with USGMII specifications</li></ul> |
| Reduced RBOM                | <ul style="list-style-type: none"><li>Integrated MDI interface resistors and capacitors</li><li>Clock cascading</li></ul>   |
| Energy efficient            | <ul style="list-style-type: none"><li>IEEE 802.3az Energy Efficient Ethernet for all supported data rates</li><li>Advanced power management modes for significant power saving.</li></ul>                         |
| Management                  | <ul style="list-style-type: none"><li>MDC/MDIO management interface</li></ul>   |
| Thermally efficient package | <ul style="list-style-type: none"><li>14 mm × 20 mm LQFP Green compliant package</li><li>Enable fan-less or heatsink-less design</li></ul>  |

## Target Applications

- Enterprise/Campus/SMB high density access GbE switch



To deliver the data infrastructure technology that connects the world, we're building solutions on the most powerful foundation: our partnerships with our customers. Trusted by the world's leading technology companies for 25 years, we move, store, process and secure the world's data with semiconductor solutions designed for our customers' current needs and future ambitions. Through a process of deep collaboration and transparency, we're ultimately changing the way tomorrow's enterprise, cloud, automotive, and carrier architectures transform—for the better.

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