Product Brief

Alaska® M 3610 Single-Port 10GbE Copper PHY

10/100/1000/2.5G/5G/10GBASE-T Ethernet Transceiver with PTP and MACsec

P/N MV-CUX3610, MV-CUX3610M

Overview

The Marvell® Alaska® M MV-CUX3610[M] is a family of fully IEEE 802.3an 10GBASE-T or IEEE 802.3bz/NBASE-T-compliant single-port physical layer (PHY) devices that support the following network rates:

- 10GBASE-T/5GBASE-T/2.5GBASE-T/ 1000BASE-T/100BASE-TX/10BASE-Te.

The device integrates features such as Precision Time Protocol (PTP)/1588v2, Synchronous Ethernet (SyncE), IEEE MAC Security (256-bit AES MACsec, MV-CUX3610M only), and IEEE 802.3az Energy Efficient Ethernet (EEE).

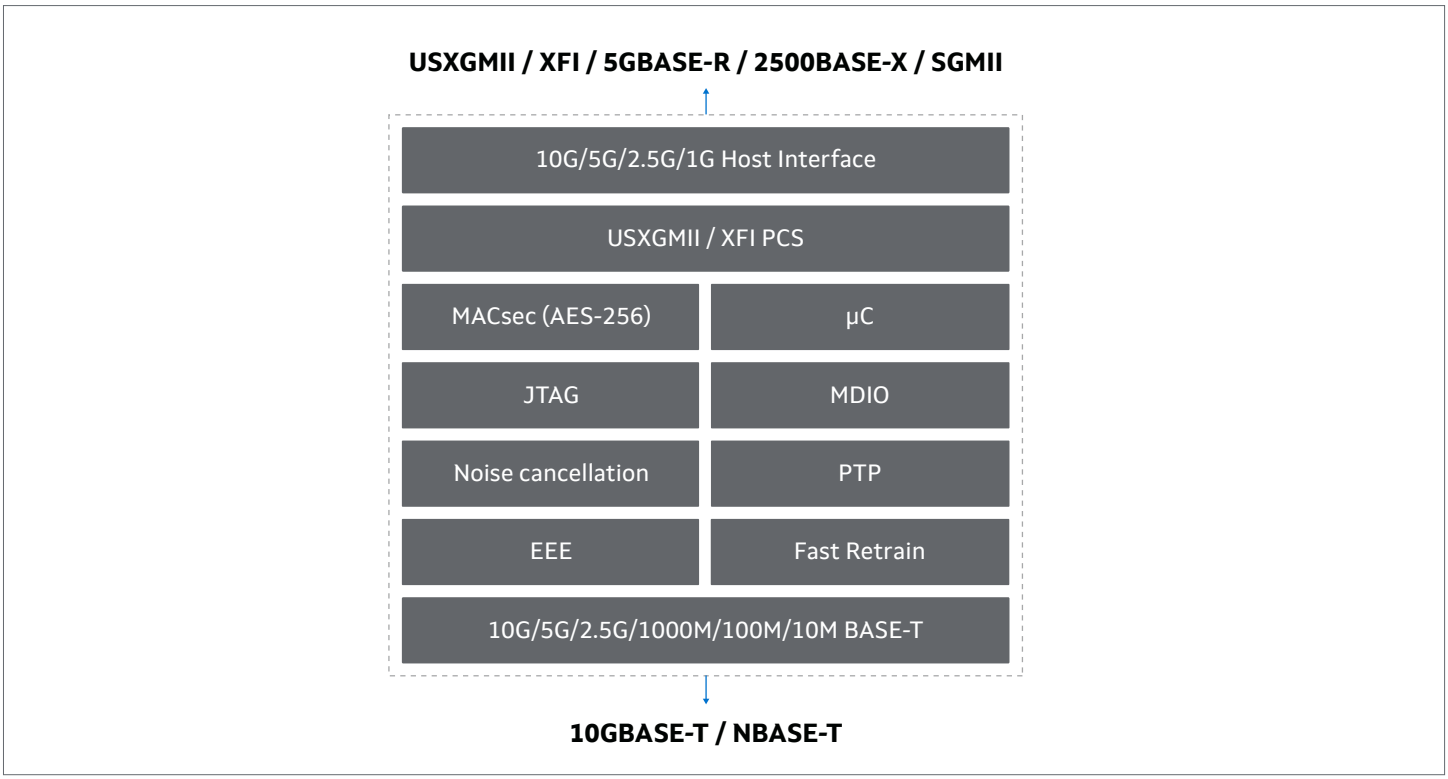
The device supports XFI Rate Matching for 5G/2.5G/1G/ 100M/ 10M with full backward compatibility with lower speed legacy Ethernet rates including 1 Gbps, 100 Mbps, and 10 Mbps. The MV-CUX3610[M] meets 10GKR electrical specifications on FR4 with an insertion loss up to 25 dB.

This PHY device family enables extremely low power across all structured wiring cable lengths for 10 Gbps applications. The MV-CUX3610[M] supports Category 6 and Category 6A cables at full IEEE 802.3an range as well as Category 5e cables for data rates up to 5 Gbps and distances greater than 100m.

These Ethernet transceivers feature integrated 1-step/2-step PTP functionality in compliance with IEEE 1588v2 and Synchronous Ethernet (SyncE) support. The device supports PTP time stamping, through a Packet Control Header (PCH), which complies with the USXGMII specification.

The MV-CUX3610[M] family incorporates Marvell advanced Virtual Cable Tester® (VCT®) technology for cable fault detection and proactive cable performance monitoring. With advanced digital signal processing, the transceiver proactively monitors the performance of a cable and determines cable length and type. It can detect opens and shorts, then report the location of a fault.

Block Diagram



Key Features

Features	Benefits
Media port speed	• Single-port, 6-speed PHY, operating at 10G/5G/2.5G/1G/100M/10M data rates on UTP copper lines • Compliant with IEEE 10GBASE-T specifications for 10G mode and IEEE 802.3bz/NBASE-T specifications for 5G and 2.5G modes • 100m reach on CAT 6A in 10G mode • >100m reach on CAT 5e in 5G and 2.5G modes • >500m reach on CAT 5e in 100M mode (surveillance camera) • BER better than 10^{-15}
Host interfaces	• USXGMII, XFI, 5GBASE-R, 2.5GBASE-X, and SGMII system-side interfaces on all devices • Meets 10GKR electrical specifications on FR4 with an insertion loss up to 25 dB
Rate matching	• XFI with rate matching and in-band flow control support for 5G/2.5G/1G/100/10BASE-T line interface
Time stamping	• IEEE 1588v2 time stamping (1-step and 2-step) and SyncE support • 1-step PTP based on packet control header (PCH)/Marvell control header (MCH) with Class-C accuracy
Energy efficiency	• IEEE 802.3az Energy Efficient Ethernet for all supported data rates
Security	• MACsec (IEEE 802.1ae, MAC security standard) • Full support for Advanced Encryption Standard (AES-256) and standalone operation • Applies to MV-CUX3610M device only
Management	• I2C-compatible management interface • MDC/MDIO management interface
Thermal management	• On-chip thermal sensor
Package characteristics	• 7 mm × 7 mm FC-BGA package with 0.8 mm ball pitch

Target Applications

- Wi-Fi 7 access points
- xPON, xDSL and DOCSIS gateways and routers
- Fixed wireless broadband gateways
- 5G small cells
- Video surveillance cameras

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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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