Marvell Alaska X 88X3140/3120

Alaska X 88X3140 and 3120 Quad and Dual Port
10GBASE-T/1000BASE-T/100BASE-TX Transceivers with Low Power,
Low Latency and Energy Efficient Ethernet Support

▶ PRODUCT OVERVIEW

Marvell®'s fourth generation PHY transceivers Alaska® X 88X3140 and 3120 provide a mixed-signal solution that performs physical layer functions for 10Gbps transmission over twisted pair wiring compliant with the 10GBASE-T standard published as IEEE Std 802.3an™. The 88X3140 and 3120 also support 1000Mbps and 100Mbps speeds compliant with the IEEE Std 802.3™-2005. The 88X3140 and 3120 are based on a multi-patented and proven PHY architecture that has demonstrated best in class performance and is currently in volume production.

Key features of the 88X3140 and 3120 include a small footprint, low power consumption, support for 100m (2.5W per port) and optional 30m short reach modes. Both transceivers also support a unique interoperable data center reach mode that supports links up to 7m, with 1.9W power consumption and 1.5micro-second latency. The 88X3140 and 3120 are fully compliant with the IEEE Std 802.3an™, and also support 100BASE-TX and 1000BASE-T, with Clause 28 auto-negotiation. The transceivers interface to the host over XAUI, RXAUI or XFI interfaces, with modifications to support SGMII.

88X3140 and 3120 are an ideal solution for dual and quad port Ethernet server adapters, high density LAN switch to server, LAN switch to switch, iSCSI based IP storage and test equipment designs.
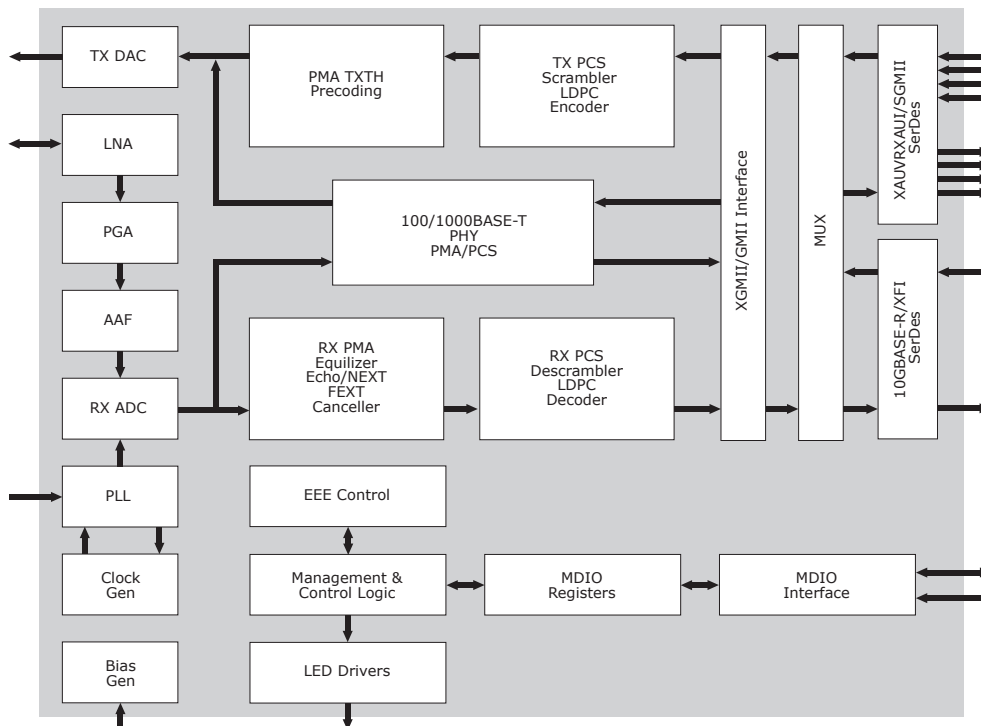
▶ BLOCK DIAGRAM

Fig 1. 88X3140 and 3120 Block Diagram (one port)

▶ KEY FEATURES AND BENEFITS

FEATURES	BENEFITS
• Lowest power 2.5W/port at 100 meters, 2.3W at 30 meters	• Solution provides significant power savings both in standard run-time and through various configurable power savings techniques.
• DataCenter Mode - 1.9W/port at 7 meters, 1.5 micro-second latency	
• Dynamic Power Scaling™ (DPS) by reach	• The implementation of latest technologies, such as EEE, allow for increased power savings in low or no use timeframes.
• Automatic link detect and deep sleep power saving modes	
• 802.3az EEE (Energy Efficient Ethernet) compliant	
• Wake on LAN	
• Intelligent Power Optimization (IPO) engine	
• XAUI, RXAUI, and XFI host interfaces	• Multiple interfaces for ease of integration
• XFI reach of more over 16" of FR4	• Provides flexibility in design
• Advanced cable diagnostics	• Allow diagnosis and repair of damaged cabling
• 27x27mm, 676-ball, 1mm pitch, H-FCBGA, ROHS6	• Small footprint which utilizes minimal board real estate

▶ IEEE STANDARDS COMPLIANCE

- IEEE Std 802.3an™
- Reach
    — More than 120 meters on Category 6A & Category 7 cable*
    — 55 to 100 meters on Category 6 cable*
    — Up to 55 meters on Category 5e cable

    Under worst-case standard-compliant channel, with 4 connectors in the presence of ANEXT (injection and six around one) on Category 6/6a/7 cable
- BER better than 10^{-15}
- Latency < 1.5 µs (Datacenter Mode)
- Startup time less than 2 seconds
- IEEE Std 802.3an™ DSQ128 line side modulation
- IEEE Std 802.3ae™-2005 Clause 47 compliant XAUI
- IEEE Std 802.3™ Clause 28 compliant auto-negotiation
- IEEE Std 802.3ae™-2005 compliant MDIO Interface
    — 100BASE-TX/1000BASE-T Clause 22 register set support via Clause 45
    — IEEE Std 802.3ae™-2005 and IEEE Std 802.3an™-2006 Clause 45 support

THE MARVELL ADVANTAGE: Marvell products come with complete reference designs which include board layout designs, software, manufacturing diagnostic tools, documentation, and other items to assist customers with product evaluation and production. Marvell's worldwide field application engineers collaborate closely with end customers to develop and deliver new leading-edge products for quick time-to-market. Marvell utilizes world leading semiconductor foundry and packaging services to reliably deliver high-volume and low-cost total solutions.

ABOUT MARVELL: Marvell is a leader in storage, communications and consumer silicon solutions. Marvell's diverse product portfolio includes switching, transceiver, communications controller, processors, wireless, power management and storage solutions that power the entire communications infrastructure, including enterprise, metro, home, storage, and digital entertainment solutions. For more information, visit our website at www.marvell.com.