Overview

The Marvell® Alaska® 88X3580 is a fully IEEE 802.3an 10GBASE-T or IEEE 802.3bz/NBASE-T -compliant 8-port physical layer (PHY) device that supports IEEE 802.3az Energy Efficient Ethernet (EEE). The device supports a wide variety of host-side interfaces including MP-USXGMII (Multi-port USXGMII), USXGMII, XFI, 5GBASE-R, 2.5GBASE-X, and SGMII to support full backward compatibility with lower speed legacy Ethernet rates including 1 Gbps, 100 Mbps, and 10 Mbps. MP-USXGMII decreases the number of I/O pins on the MAC interface and lowers the overall power consumption. The 88X3580 supports four MP-USXGMII interfaces (20G-DXGMII) for eight ports of 10GBASE-T or two MP-USXGMII interfaces (20G-QXGMII) for eight ports of 5G/2.5GBASE-T.

This device family enables extremely low power across all structured wiring cable lengths, enabling dense 10 Gbps applications. The 88X3580 supports Category 6- (shielded or unshielded), Category 6A- (Augmented) and Category 7-type cables at full IEEE 802.3an range as well as Category 5e-type cables for data rates up to 5 Gbps and distances greater than 100m.

The 88X3580 also incorporates the Marvell advanced Virtual Cable Tester® (VCT®) technology for cable fault detection and proactive cable performance monitoring. With advanced digital signal processing (DSP), the transceiver can proactively monitor the performance of a cable and determine cable length and type. It can detect opens and shorts, then report the location of a fault. The 88X3580 has integrated 2-step PTP functionality in compliance with IEEE 1588v2 and Synchronous Ethernet (SyncE) support.

Block Diagram

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OCTAL USXGMII/ MP-USXGMII/ XFI/5GBASE-KR/2.5GBASE-KX/SGMII Host interface

20G/10G/5G/2.5G/1G Host Interface

MP-USXGMII/ XFI PCS + RS FEC

Config. uC

JTAG MDIO

Noise Cancellation PTP

EEΕ Fast Retrain

10G/5G/2.5G/1000M/100M/10M BASE-T

Octal 10G BASE-T/ NBASE-T
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Key Features

<table>
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<tr>
<th>Features</th>
<th>Benefits</th>
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| Speed             | • 8-port, 6-speed PHY, operating at 10, 100 Mbps, 1, 2.5G, 5G, or 10 Gbps data rates on UTP copper lines  
                     • Compliant with IEEE 10GBASE-T specifications for 10G mode and IEEE 802.3bz/NBASE-T specifications for 5 GbE and 2.5 GbE modes  |
| Host interface    | • MP-USXGMII (20G), USXGMII, XFI, 5GBASE-R, 2.5GBASE-X, and SGMII system-side interfaces on all devices  |
| Rate matching     | • XFI with Rate matching and in-band flow control support for 5G/2.5GBASE-T data rates  |
| Time stamping     | • IEEE 1588v2 timestamping (2-step) and SyncE support  |
| Energy efficient  | • IEEE 802.3az Energy Efficient Ethernet for all supported data rates  |
| Performance       | • >100m reach on CAT 5e for 5G and 2.5G modes. 100m reach on CAT 6A for 10G mode  
                     • >500m reach on CAT 5e in 100M for surveillance camera applications  
                     • Meets 10GKR electrical specifications on FR4 with an insertion loss up to 25 dB  
                     • Meets 25GKR electrical specifications on FR4 with an insertion loss up to 30 dB  |
| Management        | • I2C-compatible management interface  
                     • MDC/MDIO management interface  |
| Package           | • 17 mm × 17 mm FC-TFBGA package  |

Target Applications

- Enterprise/Campus Access mGig
- High density 10G switches (aggregation)
- SMB 10G connectivity