Marvell 88E2580 Octal-Port 2.5/5GbE copper PHY
Octal 10/100/1000/2.5G/5GBASE-T Ethernet Transceiver with IEEE 1588v2 PTP Support

Overview
The Marvell® Alaska® 88E2580 is a fully 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 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 2.5/5 Gbps applications. The 88E2580 supports Category 5e-type cables for data rates up to 5 Gbps and distances greater than 100m.

The 88E2580 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/XFI/5GBASE-R/250BASE-X/
SGMII 20G-OXGMII, 20G-QXGMII, 10QXGMII

Host Interface
MP-USXGMII / XFI PCS + RS FEC
Config.
JTAG
Noise Cancellation
EEE
5G/2.5G/1000M/100M/10M BASE-T

Octal 2.5/5G NBASE-T
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Octal 2.5/5G NBASE-T
**Key Features**

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| Speed          | • 8-port, 5-speed PHY, operating at 10, 100 Mbps, 1, 2.5G, or 5Gbps data rates on UTP copper lines  
• Compliant with 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.  
• >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 2.5/5G switches (aggregation)
- SMB 2.5/5G connectivity