MARVELL

Product Brief

Brightlane™ Q6223 Central Switch

12-port Automotive Ethernet switch with integrated 1000BASE-T1 PHYs and MACsec

P/N MV-Q6223

Overview

The Brightlane™ Q6223 (MV-Q223) is a secure, managed Automotive Ethernet switch designed for use in numerous applications, including as a central switch in zonal network architectures. It offers 90 Gbps of non-blocking switching capacity and features a wide array of advanced security features. The device is a member of the fourth generation of Marvell Automotive Ethernet switches.

The 12-port switch includes two integrated IEEEE 802.3-compliant 1000/100BASE-T1 PHYs, 2x RGMII/MII/RMII, 4x multi-speed 2.5 Gbps SerDes (2.5G/1Gbps) and 8x multi-speed 10 Gbps SerDes (10G/5G/2.5G/1Gbps). Additionally, two of the 10G SerDes can be configured as a PCIe Gen3 x2 interface.

The port interface options offer flexible configurations for connectivity to external devices, such as 2.5/5/10GBASE-T1 PHYs, or uplinks to host SoCs. This makes the device ideal for in-vehicle networking (IVN) applications, such as advanced driver assist systems (ADAS), zonal control modules, and central gateways.

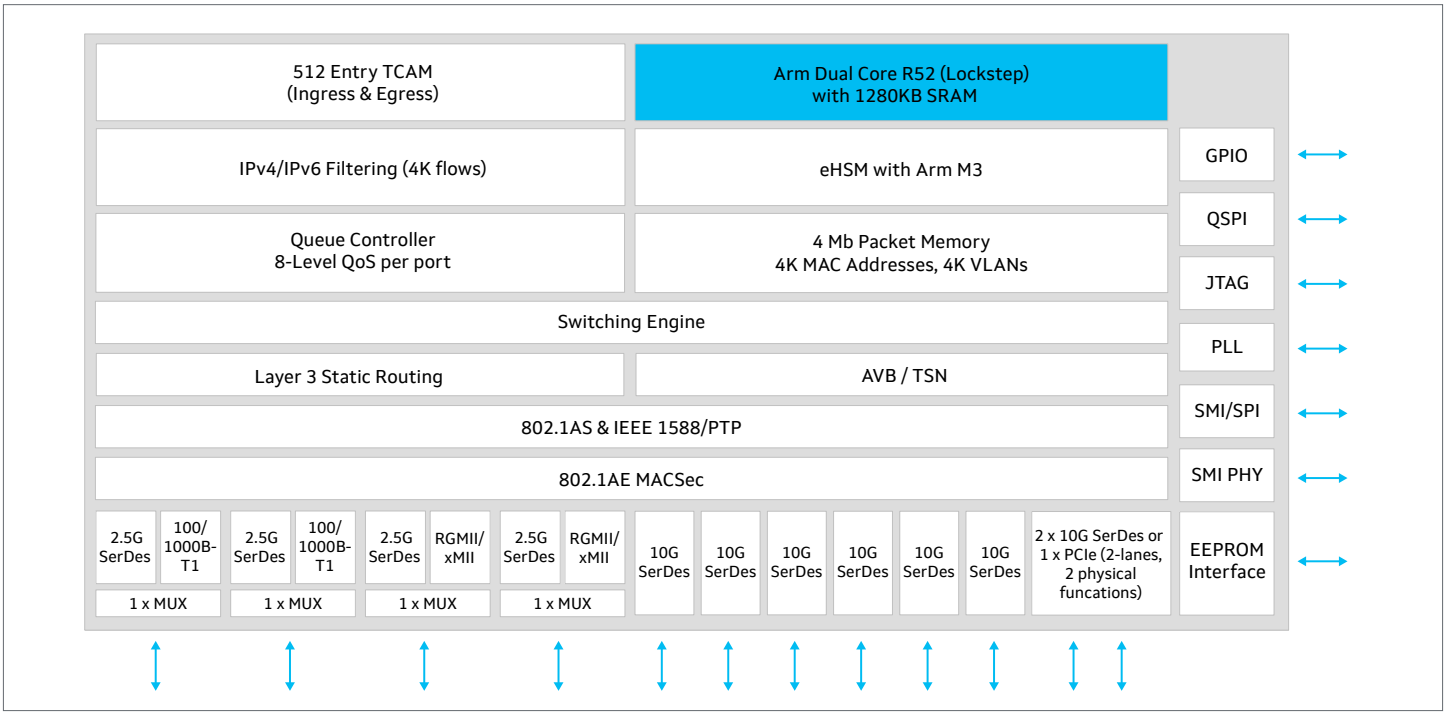
The MV-Q6223 includes a high-performance dual core ARM® R52 CPU that operates in lockstep, with dedicated on-chip memory to support Time Sensitive Networking (TSN) protocols such as Precision Time Protocol (PTP) and security firewall to protect from external malicious attacks.

The switch incorporates advanced security features including 802.1AE MACsec, which provides link security to prevent man-in-the- middle attacks; and a Denial of Service (DoS) engine.

A patented, enhanced TCAM implementation for deep packet inspection (DPI) filters and classifies over 4,000 IPv4/IPv6 flows, and trusted boot functionality secures the vehicle network.

An embedded hardware security module (HSM) enhances device security by supporting secure and encrypted boot and performs key management for features such as MACsec.

Block Diagram



Key Features

Features	Benefits
Processor	• Integrated dual core Arm R52 CPU operating in lockstep
Security	• 802.1AE MACsec • Embedded hardware security module (eHSM) • Secure boot and encrypted boot support
Switch port interfaces	• 2x 1000BASE-T1/100BASE-T1 PHYs • 2x RGMII/MII/RMII • 4x multi-speed SerDes (2.5G/1Gbps) • 8x multi-speed SerDes (10G/5G/2.5G/1Gbps) • 1x PCIe Gen 3 x2 supporting single root I/O virtualization (SR-IOV)
I/O interfaces	• Configurable GPIO • JTAG interface for debugging • SMI/SPI interface for configuration • QSPI with configurable frequencies (19.2MHz-83.3MHz)
Time Sensitive Networking (TSN) support	• 802.1AS-2020 • 802.1Qat / Qav / Qbu / Qbv / Qci / Qcr • 802.1CB
Automotive qualified	• AEC Q-100 • Automotive Grade 2 (-40°C to +105°C)
Package characteristics	• 17mm x 17mm, 360 pin TFBGA, 0.8mm pitch

Target Applications

- Central gateway
- Zonal control module
- In-vehicle infotainment
- Advanced driver assistance systems (ADAS)
- Body domain controller

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