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Marvell Delivers Industry's Highest Capacity Central Automotive Ethernet Switches for In-Vehicle Networks

- *New switch family sets a benchmark in an emerging category of automotive switches to support the zonal networking architectures of next-generation vehicles.*
- *With 90 Gbps of bandwidth, the Brightlane™ Q622x switch family delivers nearly 2x the bandwidth of commercially available solutions.*
- *Switch family integrates an advanced set of security technologies for enhancing encryption and preventing man-in-the-middle and other attacks.*

SANTA CLARA, Calif., June 8, 2023 /PRNewswire/ -- Marvell Technology, Inc. (NASDAQ: MRVL), a leader in data infrastructure semiconductor solutions, today announced the Brightlane Q622x family of central Automotive Ethernet switches, the highest capacity switches in a new, emerging category of devices for enabling computing architectures to improve safety and deliver software-defined services for the next generation of vehicles.

Automotive manufacturers are rapidly shifting from architectures built around domain networking schemes (where switches manage devices linked to particular applications such as infotainment or safety) and point-to-point connections to zonal networking architectures built around more scalable Ethernet. This shift will enable automakers to dramatically improve the onboard computing capabilities of vehicles for advancing safety systems, enhancing infotainment, increasing fuel efficiency and introducing software-defined services for a better driving experience. This shift, however, requires rethinking the technology used to build vehicle network platforms.

Central Automotive Ethernet switches are high-bandwidth, high-performance devices optimized to coordinate data traffic between zonal switches, which aggregate traffic from devices located within a physical zone of a car like processors, sensors, actuators, storage systems and others. Typical cars based around zonal architectures in the future will have three to up to six zones. Using a combination of zonal and central switches will provide automakers with a foundation for optimizing network performance, adding new features and services and accommodating growing bandwidth demands. Ethernet-based zonal architecture also reduces the amount of network cabling required, which reduces weight and manufacturing complexity.

Optimized for the most advanced automotive architectures, the Brightlane Q6223 switch delivers 90 Gbps of bandwidth, nearly 2x the capacity of currently available automotive switches. The non-blocking 12-port design can be configured from among the eight integrated 10G SerDes ports, four integrated 2.5G SerDes ports, and two integrated 1000Base-T1 PHYs available. The Brightlane Q6222 contains nine ports for 60 Gbps, with five integrated 10G SerDes ports, four integrated 2.5G SerDes ports, and two integrated 1000Base-T1 PHYs available for selection. Both the 90 Gbps and 60 Gbps Brightlane Q622x switches are single-chip devices to reduce cost, power and latency.

The new switch family also includes a combination of advanced security features not found together in any other automotive switch product. The Brightlane Q622x family incorporates IEEE 802.1AE-2018-compliant Media Access Control (MACsec) link security on every port, up to 10G, for encrypting data traveling between automotive components to prevent man-in-the-middle and other attacks. Marvell's patent-pending Ternary Content Addressable Memory (TCAM) implementation for deep packet inspection (DPI) provides for wirespeed packet classification to ensure packet validity and the ability to filter and classify more than 4,000 IPv4/IPv6 flows for heightened intrusion detection. Additionally, the Q622x family incorporates a hardware security module (HSM) for encryption, MACsec key management and trusted boot functionality to further secure the in-vehicle network.

"Marvell continues to deliver industry-first advances in Automotive Ethernet technologies to meet the needs of the most demanding customers as they develop their next-generation software-defined vehicles," said Mike Yeager, vice president and general manager, Automotive Business Unit at Marvell. "With the new Brightlane switch family, we're delivering future-proofed bandwidth, reducing BOM space and cost, and providing the most advanced, comprehensive combination of security features available."

Driving the Roadmap for Connected Cars
The Q622x family is the latest addition to Marvell's comprehensive portfolio of Automotive Ethernet switches, PHYs and camera bridges to enable the transformation of transportation. The number of Automotive Ethernet ports shipped annually is growing at nearly 40% per year, with shipments expected to surpass one billion ports annually by 2025, more than 10x the total shipped in 2018[1].

Marvell is collaborating with over 40 OEMs, including design wins with eight of the 10 largest, on a variety of Automotive Ethernet solutions.

"The software-defined car depends on new hardware. And it won't happen without Ethernet," said Roger Lanctot, director of Automotive Connected Mobility at TechInsights. "By pushing the envelope on networking, Marvell is giving automotive designers a platform for adding new services and improving performance, while eliminating complexity. And in the process, they'll enhance the driving experience."

Brightlane Q622x Feature and Benefit Highlights

- 90/60G non-blocking switching bandwidth provides single-chip networking for the largest compute clusters.
  - 90G includes eight integrated 10G SerDes ports; 60G includes five integrated 10G SerDes ports.
  - 90G and 60G include four integrated 2.5G SerDes ports.
  - 90G and 60G include two integrated 1000Base-T1 PHYs.
- One PCIe Gen 3 x2 interface delivers the max Ethernet bandwidth available over the PCIe interface.
- Enhanced TCAM delivers wirespeed packet classification for more than 4,000 IPv4/IPv6 flows.
- 802.1AE-2018 MACsec provides link security on every port.
- Embedded HSM enables software authentication and data encryption.
- Arm®-based Dual Core R52 processor provides higher performance and lockstep redundancy for mission-critical applications.
- Time-Sensitive Networking supports the latest TSN standards to reduce latency and ensure quality of service for essential vehicular connectivity, including the IEEE

802.1CB standard for data redundancy.

Availability
The Brightlane Q622x family is currently sampling to multiple leading automotive customers and partners.

About Marvell
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 over 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.

[1]Source: Marvell estimates (Ethernet port units, growth) and TechInsights (Automotive Infotainment and Telematics Systems, 2022)

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