Zone-Based Automotive Backbones Tunneling PCIe® Architecture

Missing Link Electronics (MLE) announced today that they are partnering with Fraunhofer Heinrich-Hertz-Institute (HHI) and Fraunhofer Institute for Photonic Microsystems (IPMS) on ultra-reliable, deterministic low-latency transports for automotive networks tunneling PCI Express® (PCIe®) architecture.

The need for more safe and eco-friendly vehicles drives automotive connectivity towards so-called Zone-Based Architectures. Inside those so-called Zone Gateways PCIe technology provides the connectivity between multiple System-on-Chip (SoC), CPUs, GPUs, and FPGAs for scalable performance. Within the automotive network, multiple Zone Gateways connect with each other via the emerging IEEE standards “Time Sensitive Networking” (TSN).

Today, Fraunhofer and MLE can provide a working proof-of-concept in form of a digital circuit & system stack which encapsulates and decapsulates PCIe packets (and other protocols) over real-time automotive TSN Ethernet and which scales up to 100 Gbps.

“When we started working on network protocol acceleration in 2010 we looked at future connectivity needs for systems-of-systems such as ships and cars”, states Ulrich Langenbach, formerly with Fraunhofer HHI and now Director Engineering at MLE. “Therefore, our approach does address key topology requirements for modern vehicles which is reliable and cost-efficient PCIe long-range, support for NVMe SSD storage, as well as CPU-to-CPU communication via PCIe Non-Transparent Bridges (NTB)”.

“Our approach of closely adhering to the OSI Layers makes our TSN Switched-Endpoint very interoperable with different Ethernet PHY solutions”, says Marcus Pietzsch, Group Leader IP Cores and ASIC Design at IPMS and emphasizes: “This is vital as the standards and commercial offerings for TSN and for automotive Ethernet are still very fluid!”

“PCI-SIG’s mission is to bring together developers seeking innovation and product compliance around current and future PCIe specifications,” said PCI-SIG President Al Yanes. “The purpose of PCI-SIG’s Automotive Work Group is to facilitate the discussion of PCIe technology in the automotive ecosystem with member companies like MLE.”

About PCI-SIG

PCI-SIG® is the consortium that owns and manages PCI specifications as open industry standards. The organization defines industry standard I/O (input/output) specifications consistent with the needs of its members. Currently, PCI-SIG is comprised of over 900 industry-leading member companies. To join PCI-SIG, and for a list of the Board of Directors, visit www.pcisig.com.

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About Missing Link Electronics

Missing Link Electronics has been engaged in PCI-SIG and contributes to the recently founded Automotive Work Group to drive the adoption of PCI technology into the automotive environment. MLE was founded in 2010 by a group of business and technology veterans in the semiconductor and embedded systems domain and, since then, has established a reputation for delivering robust solutions in a timely manner. MLE has a sales and R&D office located in Germany and is headquartered in Silicon Valley. For more information, please visit: https://www.missinglinkelectronics.com

About Fraunhofer Institute for Photonic Microsystems IPMS

Founded in 1949, the German Fraunhofer-Gesellschaft undertakes applied research of direct utility to private and public enterprise and of wide benefit to society. With a workforce of over 28,000, the Fraunhofer-Gesellschaft is Europe's biggest organization for applied research, and currently operates a total of 72 institutes and research units.

Fraunhofer HHI was founded in 1928 as "Heinrich-Hertz-Institut für Schwingungsforschung" and in 2003 joined the Fraunhofer-Gesellschaft as the "Fraunhofer Institute for Telecommunications, Heinrich-Hertz-Institut". Today it is the leading research institute for networking and telecommunications technology, "Driving the Gigabit Society". For more information, please visit https://www.hhi.fraunhofer.de/en/fraunhofer-hhi/about-us.html

Fraunhofer IPMS is a worldwide leader in research and development services for electronic and photonic microsystems. Fraunhofer IPMS provides proven IP core design solutions for FPGA and ASIC with a special focus on communication as well as customization, implementation support and characterization. For more information, please visit https://www.ipms.fraunhofer.de/en/Components-and-Systems/Components-and-Systems-Data-Communication/ip-cores.html