# Shifts in semiconductor technology set to reshape business sectors



Recent developments in the semiconductor industry highlight significant shifts in technology and practices that are poised to reshape various business sectors, especially in the realms of AI automation and data communication.

David Shin from Cadence has provided insights into the eUSB2V2 specification, which has been engineered to achieve a data transfer rate of 4.8Gbps. This innovation allows for versatile configurations of links, whether asymmetrical or symmetrical, tailored to suit specific applications. This flexibility could be pivotal for businesses that rely on high-speed data transfer.

In the area of semiconductor testing, Spencer Acain from Siemens EDA has expressed the growing importance of artificial intelligence. He noted that the incorporation of analytical AI within Design for Testability (DFT) tools, alongside machine learning applied to scanning data, enhances the analysis of failure modes. This suggests that AI could significantly streamline the testing process, potentially improving efficiency and reducing downtime for manufacturing processes.

The advancing safety protocols in the automotive sector are being underscored by Dana Neustadter and Vincent van der Leest of Synopsys. They indicate that as vehicles increasingly adopt connectivity and automation, data security must take centre stage as a critical component of automotive safety. This rising emphasis on cybersecurity within automotive designs reflects broader trends in the industry towards more connected systems.

Mike Hodge from Keysight has elaborated on the regulatory landscape surrounding automotive cybersecurity, stressing the necessity of automated testing capable of addressing complex hardware and software integrations. As vehicles become more software-driven, the challenge of maintaining security across diverse systems intensifies, making robust testing mechanisms essential.

Kerry Herbert of Ansys has identified a transformative trend in data centres through the adoption of co-packaged optics. This technology integrates optical transceivers directly with chip packaging, reducing the distance data needs to travel and thus significantly lowering both latency and power consumption. The implications of this adaptation are vast, offering potential cost savings and efficiency gains for businesses that rely heavily on data processing and transmission.

Further insights into technological advancements are offered by various industry experts who address specific challenges and innovations. Ana Bernardo and Sitong He from SEMI investigate how advancements in Micro-Electro-Mechanical Systems (MEMS) and imaging technologies are unveiling new applications across sectors including automotive and data centres.

Moreover, the Low Power-High Performance newsletter features discussions on critical topics. Andy Heinig from Fraunhofer discusses risk mitigation through the distribution of security-critical functions across circuits. Additionally, Ron Lowman and Jon Ames from Synopsys outline strategies to manage high-bandwidth, low-latency connectivity to bolster AI networks, while Tim Messegee from Rambus reviews the unique applications of various DRAM types, including High Bandwidth Memory (HBM) and Low Power Double Data Rate (LPDDR).

Steve Roddy from Quadric questions the effectiveness of traditional fallback-style architectures for modern networks, emphasising that contemporary Convolutional Neural Networks (CNNs) and newer transformer models employ a wider variety of machine learning operators, requiring more versatile frameworks. Ola Liljedahl from Arm stresses best practices to enhance throughput and fairness in access to shared resources within multi-threaded applications.

Finally, Veena Parthan from Cadence discusses thermal management innovations in response to rising power densities and energy costs, emphasising approaches such as direct-to-chip cooling and full-system immersion cooling as practical solutions in high-performance environments.

Jeff Wilson from Siemens further highlights methodologies for tackling IR drop mitigation, suggesting enhancements in power grid design while adhering to compliance and performance goals.

Collectively, these insights present a landscape of evolving technologies and strategies in the semiconductor sector, signalling ongoing changes that could influence the structure and operations of businesses reliant on advanced data management and automation solutions.

Source: [Noah Wire Services](https://www.noahwire.com)

## References

* <https://community.cadence.com/cadence_blogs_8/b/fv/posts/introduction-of-high-bandwidth-embedded-usb2v2-eusb2v2-standard> - Corroborates the introduction of the eUSB2V2 specification, its data transfer rates, and its versatility in link configurations.
* <https://community.cadence.com/cadence_blogs_8/b/ip/posts/eusb2-version2-with-4-8gbps-and-the-use-cases-a-comprehensive-overview> - Provides detailed information on eUSB2V2, including its data rates, asymmetrical and symmetrical link modes, and various use cases.
* <https://community.cadence.com/cadence_blogs_8/b/ip/posts/eusb2-version2-with-4-8gbps-and-the-use-cases-a-comprehensive-overview> - Discusses the application of eUSB2V2 in modern notebook PCs, AI-enabled IoT devices, and other scenarios, highlighting its benefits in high-speed data transfer and low power consumption.
* <https://www.synopsys.com/designware-ip/technical-bulletin/data-security-in-automotive-designs.html> - Although not directly linked, this source from Synopsys discusses the importance of data security in automotive designs, aligning with the insights from Dana Neustadter and Vincent van der Leest.
* <https://www.keysight.com/us/en/solutions/automotive-cybersecurity.html> - Supports Mike Hodge's elaboration on the regulatory landscape and the necessity of automated testing for automotive cybersecurity.
* <https://www.ansys.com/about-ansys/insights/co-packaged-optics-data-centers> - Corroborates Kerry Herbert's discussion on co-packaged optics in data centers, highlighting its impact on latency and power consumption.
* <https://www.semi.org/en/resources/semi-advances/mems-and-imaging-technologies> - Supports Ana Bernardo and Sitong He's insights into advancements in MEMS and imaging technologies and their applications.
* <https://www.fraunhofer.de/en/press/research-news/2023/04/security-critical-functions-distribution.html> - Aligns with Andy Heinig's discussion on risk mitigation through the distribution of security-critical functions across circuits.
* <https://www.synopsys.com/designware-ip/technical-bulletin/managing-high-bandwidth-low-latency-connectivity.html> - Corroborates Ron Lowman and Jon Ames's strategies for managing high-bandwidth, low-latency connectivity in AI networks.
* <https://www.rambus.com/blogs/high-bandwidth-memory-hbm/> - Supports Tim Messegee's review of High Bandwidth Memory (HBM) and its applications.