

CES 2024: Only a few new CAN-related products

The CES tradeshow in Las Vegas is an important technology trend fair for the automotive industry. CAN-based embedded and deeply embedded networks were often hidden and not shown openly.



Figure 1: More than 130000 visitors attended the CES 2024 tradeshow, a record with plus 40 percent (Source: CTA)

The tradeshow took place from January 9 to 12, 2024. "No other event in the world connects the full ecosystem of the tech industry like CES," said Gary Shapiro, president and CEO, Consumer Technology Association (CTA). "This year at CES, we are excited to spotlight the critical role that technology is playing to improve every aspect of the human experience." One of the major topics on many of the more than 4300 booths was AI (artificial intelligence). It was front and center with applications that can improve health care, sustainability, productivity, accessibility, mobility, and more.

Qualcomm and Robert Bosch introduced a central vehicle computer capable of running infotainment and advanced driver assistance system (ADAS) functionalities on one single system-on-chip (SoC). Bosch unveiled this central vehicle computer, known as its cockpit & ADAS integration platform, that is based on the Snapdragon Ride Flex SoC.

Qualcomm's Flex SoC is designed to support mixed-criticality workloads, allowing for digital cockpit, ADAS and automated driving (AD) capabilities to be co-implemented on

a single SoC. This capability enables automakers to realize a unified central software-defined vehicle (SDV) architecture that scales from entry to premium tiers. Leveraging the Flex SoC, Bosch's vehicle computer can implement ADAS applications such as object/traffic and light/lane detection, automated parking, smart and personalized navigation, voice assistance, control for multiple displays as well as processing for camera, radar, and ultrasonic data.

"We are pleased to work with Bosch to have our Snapdragon Ride Flex SoC enable their new central vehicle computer, further underscoring our shared commitment to technological innovation within automotive," said Nakul Duggal from Qualcomm. "The fusion of infotainment and ADAS functionalities on a single SoC is a milestone for the industry, offering a high performance, scalable solution for automakers to realize next-generation software-defined vehicles."

"With the cockpit and ADAS integration platform, we can once again demonstrate our outstanding cross-domain expertise and experience. We are proud to be ►

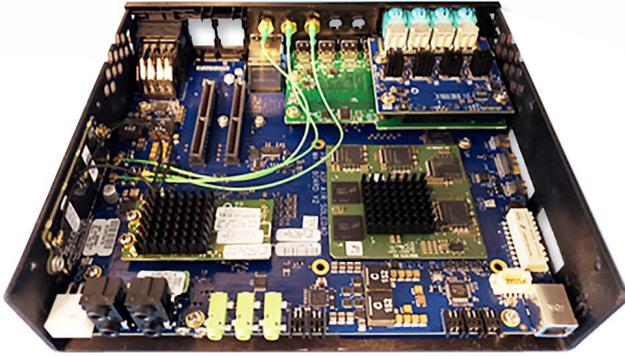


Figure 2: Automotive development platform with four CAN FD and two LIN interfaces (Source: Lantronix)

the world's first Tier-1 supplier to demonstrate the interaction of system functions from previously separated domains in a single central computer in collaboration with Qualcomm Technologies," said Christoph Hartung, president of the Cross-Domain Computing Solutions division at Bosch. "With this cost-effective solution we are paving the way for bringing even more ADAS functions into vehicles, including in the entry-level and mid-range segment."

Lantronix offers automotive development platforms featuring the Snapdragon SoC. The SA8295P board is based on Qualcomm's QAM8295P chipset. It has been developed as an SEooC (safety element out of context) targeting assumed ASIL B classified functional safety use cases. The key components of the QAM8295P module include the

SA8295P SoC, four instances of the PMM8295AU power management IC, one third party power management IC, and two 556-ball LPDDR4X SDRAMs. The development platform provides infotainment interfaces such as one Ethernet 1000-Base-T1 and two Ethernet 100-Base-T1 as well as Wi-Fi and Bluetooth. Additionally, four CAN FD and two LIN interfaces are on board.

Awarded at CES

Ambarella partnering with Continental, another German Tier-1 automotive supplier, has been awarded at the CES tradeshow for its CVS3-AD685 AI domain controller chip. It targets L2+ to L4-classified autonomous vehicles. Its next-generation CVflow AI engine includes neural network processing that is 20-times faster than the previous generation of CV2 SoCs. The SoC also integrates advanced image processing, a dense stereo and optical flow engine, Arm Cortex A78AE and R52 CPUs, an automotive GPU for visualizations, and a hardware security module (HSM). Of course, the SoC features CAN FD connectivity. Via this interface, the AI software can be fed with information originated in the in-vehicle networks.

"Following the recent endorsements from major Tier-1 suppliers, our CV3-AD domain controller family is transforming the automotive AD and ADAS market, through its unique combination of highly efficient AI processing, advanced image processing and ultra-low power consumption," said Fermi Wang, CEO of Ambarella. "The CV3-AD685 >

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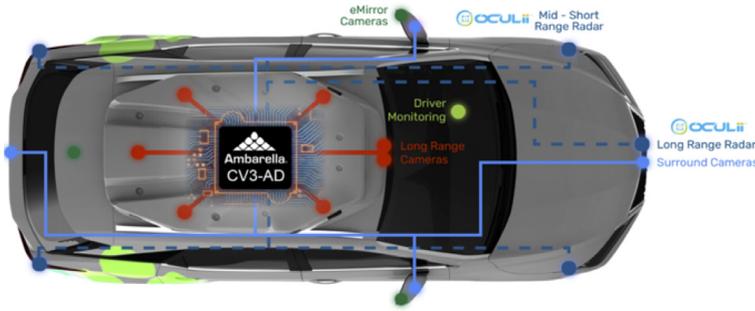


Figure 3: The CV3-AD system-on-chip family designed for use in autonomous driving vehicles and for future advanced driver-assistance systems comes with CAN FD modules on chip (Source: Ambarella)

delivers new mass-production price and performance options for our customers. It extends our lead in AI performance-per-watt and introduces new radar processing capabilities that uniquely enable the single-chip centralized processing of raw video and 4D imaging radar data.”

The CVflow’s general vector processor (GVP) provides traditional computer vision processing while including specific optimization enhancements for HD radar. Twelve Arm Cortex A78AE CPUs and three dual-core, lockstep pairs of Cortex-R52 CPUs are included. The SoC is targeting ASIL-B on the chip level, with an ASIL-D safety island. The hardware security module (HSM) provides isolation of different domains and secure software provisioning, as well as a suite of advanced cybersecurity features, such as asymmetric/symmetric crypto acceleration, secure storage and key provisioning, encrypted CVflow tasks, true random number generator (TRNG), one-time programmable (OTP) memory, DRAM scrambling, and DRAM virtualization. The SoC is fabricated in Samsung’s 5-nm automotive process technology.

Ambarella announced in Las Vegas also the CV3-AD635 and CV3-AD655 SoCs, both providing CAN FD connectivity. The CV3-AD635 supports a sensing suite that includes multiple cameras and radars to enable mainstream L2+ feature sets, such as highway autopilot and automated parking. This SoC meets the GSR2 and the NCAP standards. Additionally, it enables advanced L2+ (also called L2++) with urban autopilot, as well as support for additional cameras, radars, and other sensors. With the previously announced flagship CV3-AD685 SoC, which



Figure 4: Vector presented in Las Vegas its solutions for software-defined vehicles (SDV), CAN was not in the focus (Source: Vector)

targets L3/L4 systems – along with the China-focused CV72AQ SoC – the CV3-AD family now covers the full range of AD (automated driving) and ADAS solutions.

“The CV3-AD635 and CV3-AD655 enable proven CV3-AD powerful performance in mass market L2+ and L2++ systems, while helping OEMs to reduce complexity and save costs on thermal management solutions and electric vehicle batteries,” explained Fermi Wang. “The strategic partnership between Continental and Ambarella is bringing full-stack vehicle system solutions to the road – beginning with 2027 SOPs – that

combine maximum performance and industry-leading energy efficiency,” said Ismail Dagli, Head of the Autonomous Mobility Business Area at Continental. “Based on Ambarella’s CV3-AD family, our joint solutions enable safer mobility thanks to holistic environmental perception; making them particularly well suited for the growing amount of sensor data in software-defined vehicles. Together, we are shaping the path toward Vision Zero and autonomous mobility.”

Intrepid and Vector at CES

At the CES 2024 tradeshow, about 250 exhibitors presented solutions for self-driving and electric vehicles as well as personal mobility. The CiA members Intrepid and Vector showed in Las Vegas their tools and services for network developments dedicated for the automotive industry.



Figure 5: The neoIV Connect data logger is equipped with eight CAN FD ports (Source: Intrepid)

Intrepid launched a ruggedized IP67-rate data logger, ECU simulator, and gateway solution in a production-ready form factor. This neoVI Connect data logger comes with eight CAN FD channels, two LIN ports, and one Ethernet (100/1000-Base-T) interface. Additionally, it provides Wi-Fi connectivity, an internal cell module, and GPS/GNSS functionality as well as nine IMUs (inertial measurement units). The IMU comprises an accelerometer, a gyroscope, and a magnetometer.

“The neoVI Connect platform was created through engagement with a customer, one of the world’s largest vehicle OEMs, who was using our existing neoVI Cloud wireless data logger for fleet management on a low volume vehicle and found it was exactly what they needed for series production with low-to-no development costs,” said Dave Robins, CEO of Intrepid Control Systems. “From that, we developed the expanded neoVI Connect to deliver a significant cost savings platform for the entire auto industry, as Intrepid’s development costs are shared with its customers, which consist of all electric vehicle OEMs in the US and most of the world’s ICE OEMs.”

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