



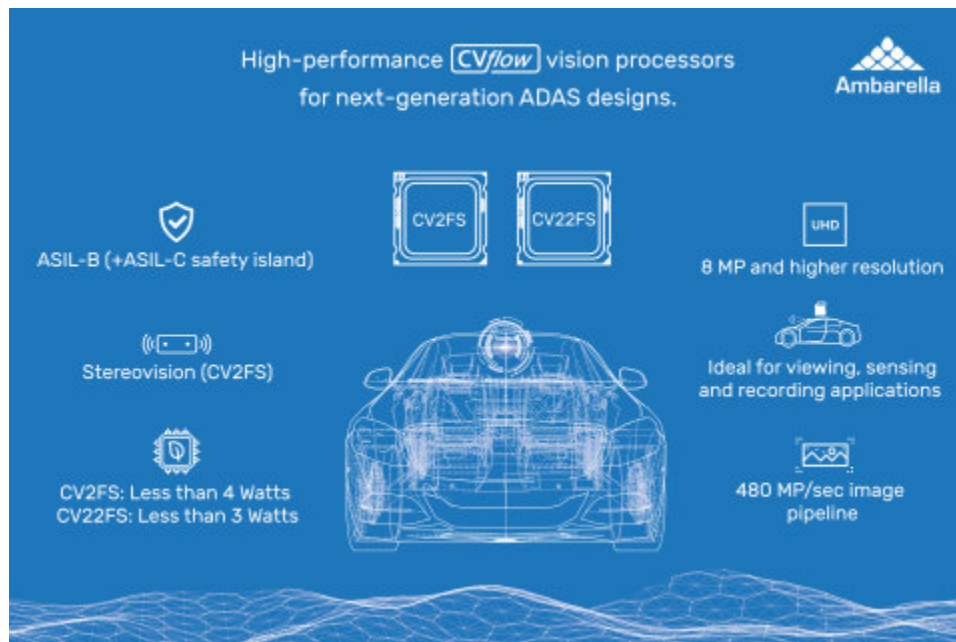
Ambarella Announces CV22FS and CV2FS Automotive Camera SoCs for Advanced Driver Assistance Systems (ADAS)

January 6, 2020

CV22FS and CV2FS feature ASIL B (Automotive Safety Integrity Level) functional safety compliance

LAS VEGAS--(BUSINESS WIRE)--Jan. 6, 2020-- Ambarella, Inc. (Nasdaq: AMBA), an AI vision silicon company, today announced the CV22FS and CV2FS automotive camera system on chips (SoCs) with CVflow® AI processing and ASIL B compliance to enable safety-critical applications. Both chips target forward-facing monocular and stereovision ADAS cameras, as well as computer vision ECUs for L2+ and higher levels of autonomy. Featuring extremely low power consumption, the CV22FS and CV2FS make it possible for tier-1s and OEMs to surpass New Car Assessment Program (NCAP) performance requirements within the power consumption constraints of single-box, windshield-mounted forward ADAS cameras. Other potential applications for the processors include electronic mirrors with blind spot detection (BSD), interior driver and cabin monitoring cameras, and around view monitors (AVM) with parking assist.

This press release features multimedia. View the full release here: <https://www.businesswire.com/news/home/20200106005372/en/>



The two new SoCs are the latest additions to Ambarella's successful CVflow SoC family that offers automotive OEMs, tier-1s, and software development partners an open platform for differentiated, high-performance automotive systems.

ZF, a global technology tier-1 and supplier of systems for passenger cars and commercial vehicles, is working with Ambarella on viewing and sensing systems:

"ZF is pleased to be working with Ambarella on the next generation of intelligent viewing platforms for Surround View Visualization, Driver Monitoring stand-alone vision processing, and e-mirror solutions for both the passcar and commercial vehicle markets," said Aaron Jefferson, vice president of ADAS product planning at ZF. "The CVflow SoCs' combination of high quality imaging and advanced AI processing enables ZF to offer a wide range of viewing and interior sensing applications."

Ambarella unveils CV22FS and CV2FS automotive camera chips for ADAS applications during CES 2020 with endorsements from partners HELLA Aglaia and ZF. (Graphic: Business Wire)

HELLA Aglaia, a leading global developer of intelligent visual perception software,

has worked with Ambarella's CVflow processors over the past year:

"We chose Ambarella's CVflow SoCs due to their ability to deliver extremely high computer vision processing performance with very low power consumption," said Kay Talmi, managing director at HELLA Aglaia. "With the introduction of the CV22FS and CV2FS ASIL SoCs, Ambarella now delivers the functional safety features required by automotive OEMs for the mass production of safety-critical systems."

"Ambarella's CVFlow architecture delivers an unparalleled combination of AI performance and power efficiency," said Fermi Wang, president and CEO of Ambarella. "We are pleased to introduce these ASIL-compliant CVflow SoCs, delivering on our promises to our partners and customers and further demonstrating our commitment to the automotive market."

The CV22FS and CV2FS's CVflow architecture provides computer vision processing in 8-megapixel or higher resolution at 30 frames per second for object recognition over long distances and with high accuracy. The SoCs each include a dense optical flow accelerator for simultaneous localization and mapping (SLAM), as well as distance and depth estimation. Multi-channel high-speed sensor input and Ambarella's industry-leading image signal processing (ISP) pipeline provide the necessary camera input support, even in challenging lighting conditions. CV2FS also enables advanced stereovision applications by adding a dense disparity engine.

Ambarella will demonstrate its CVflow SoC family during CES 2020 to select customers and partners. Demonstrations will include HELLA Aglaia's

deep learning ADAS algorithms and Ambarella's EVA (Embedded Vehicle Autonomy) self-driving prototype vehicle. Ambarella will also demonstrate a range of applications from other key partners running on the CVflow engine.

CV22FS and CV2FS are scheduled to sample to Ambarella customers in the first half of 2020.

CV22FS and CV2FS SoC key features:

- CVflow architecture with DNN support
- Quad-core 1-GHz Arm® Cortex®-A53 with NEON™ DSP extensions and FPU
- Safety island with dual-core lock step (DCLS) Arm® R52 targeting ASIL-C
- Dense optical flow engine
- Dense stereo disparity engine (CV2FS only)
- ASIL B functional safety level
- High speed SLVS/MIPI CSI-2/LVCMOS interfaces
- Multi-channel ISP with up to 480-Megapixel/s input pixel rate
- Native support for RGGB, RCCB, RCCC, RGB-IR, and monochrome sensor formats
- Multi-exposure high dynamic range (HDR) processing and LED flicker mitigation
- Real-time hardware-accelerated fish-eye dewarping and lens distortion correction (LDC)
- 4-megapixel AVC encoding for video logging and wireless video streaming
- Rich set of interfaces includes CAN FD, Gigabit Ethernet, USB 2.0 host and device, dual SD card controllers with SDXC support, MIPI DSI/CSI-2 4-lane output
- Advanced security features, including OTP for secure boot, TrustZone®, and IO virtualization
- AEC-Q100 grade 2 (-40C to +125C (T_j) operating temperature)
- 10 nm process technology

The URL for this news release and the related image: <https://www.ambarella.com/news-events/>

About Ambarella

Ambarella's products are used in a wide variety of human and computer vision applications, including video security, advanced driver assistance systems (ADAS), electronic mirror, drive recorder, driver/cabin monitoring, autonomous driving, and robotic applications. Ambarella's low-power system on chips (SoCs) offer high-resolution video compression, advanced image processing, and powerful deep neural network processing to enable intelligent cameras to extract valuable data from high-resolution video streams. For more information, please visit www.ambarella.com

About HELLA Aglaia

HELLA Aglaia Mobile Vision GmbH is a full subsidiary of HELLA GmbH & Co. KGaA and is one of the leading global developers of intelligent visual sensor systems. The result of many years of experience, our expertise in mono- and stereo-camera systems, image processing and software programming makes possible the development of innovative industrial solutions and highly effective products for driver-assistance systems, electromobility, and people counting. Many of our products set international standards and open completely new application possibilities and future opportunities. For more information, please visit: www.hella-aglaia.com

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