Overview
Ambarella's H22A SoC combines image / video processing, 12MP30 video encoding / decoding in a single, low-power design making it an ideal choice to power the next generation of automotive dash cameras / video recorders. Fabricated in a 14 nm process technology, it achieves an industry-leading combination of low power and high performance in both human vision and ADAS applications.

H22A implements a highly efficient 12MP30 AVC (H.264) / HEVC (H.265) encoder / decoder in hardware along with industry-leading image signal processor (ISP). The H22A’s ISP provides outstanding imaging in low-light conditions while high dynamic range (HDR) processing extracts maximum image detail in high-contrast scenes. The flexible architecture allows encoding of multiple streams that are optimized for storage and video streaming over WiFi / BLE simultaneously. The highly-efficient distortion correction block in hardware enables cameras with ultra wide-angle lenses.

H22A also supports multi-sensor input, thus enabling recording systems that require two or more independent sensor inputs. The quad core Arm®-A53 cores allow implementation of ADAS features such as forward collision warning, lane departure warning, driver monitoring, license plate detection and recognition, and more. To help customers implement their applications, Ambarella provides a software development kit available in RTOS (ThreadX) / Linux / RTOS + Linux (dual OS).

Key Features
Flexible Low-Power Platform
- Quad-core Arm® Cortex®-A53 CPU up to 1 GHz
- Multiple OS Support: ThreadX, Linux, ThreadX + Linux
- 14 nm low-power CMOS process

Advanced Image Processing
- Multi-sensor support
- Multi-exposure line-interleaved HDR
- Hardware dewarping engine
- Electronic image stabilization
- 3D motion-compensated noise reduction (MCTF)
- Superior low-light processing

High-Efficiency Video Codec
- 12MP30 H.264 / H.265 video compression
- Flexible multi-stream capability
- JPEG encoder for stills
- CBR and VBR bitrate control modes

Target Applications
- Multi-channel drive recorders
- Driver monitoring systems (driver distraction / driver drowsiness detection)

Block Diagram
The diagram below illustrates a design based on the Ambarella H22A device.
The H22A camera development platform contains the necessary tools, software, hardware, and documentation to develop a small form factor camera.

**Evaluation Kit (EVK)**
- H22A main board with connectors for sensor / lens board, peripherals
- Sensor board: OmniVision, Sony, and others
- Datasheet, BOM, schematics, and layout
- Reference application with C source code

**Software Development Kit (SDK)**
- ThreadX / Linux / ThreadX + Linux with patches, drivers, tools, and application source code
- Royalty-free libraries for ISP, 3A, dewarp, and codecs
- Image tuning and manufacturing calibration tools
- Detailed documentation, including a programmer’s guide and more

**Contact**  www.ambarella.com/contact-us/