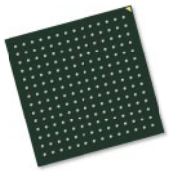
OAX8000

ASIC Product Brief



Dedicated Driver Monitoring System ASIC with Integrated AI Neural Processing Unit, Image Signal Processor and DDR3 Memory

OMNIVISION's OAX8000 is an AI-enabled, automotive application-specific integrated circuit (ASIC) optimized for entry-level, stand-alone driver monitoring systems (DMS). The OAX8000 uses a stacked-die architecture to provide on-chip DDR3 SDRAM memory (1 Gb). It also integrates a neural processing unit (NPU) and image signal processor (ISP), which provides dedicated processing speeds up to 1.1 trillion operations per second for eye gaze and eye tracking algorithms. These fast processing speeds with 1K MAC of convolutional neural network (CNN) acceleration, along with integrated SDRAM, enable the lowest power consumption available for DMS systems—the OAX8000 and OMNIVISION automotive image sensor consume just 1 watt in typical conditions, combined. This integration also reduces the board area for the engine control unit (ECU).

The OAX8000's on-chip NPU is supported by the popular TensorFlow, Caffe, MXNet and ONNX tool chains. Additionally, this ASIC embeds quad Arm® Cortex® A5 CPU cores with Neon™ technology for accelerated video encoding/decoding and on-chip video analytics algorithms, along with hardware for image processing, video encoding and RGB-IR processing. Its high dynamic range (HDR) processing capability allows the ASIC to accept input from RBG-IR image sensors and support high quality output, for videos taken during the day or at night, in conditions with widely contrasting bright and dark images. The integrated video encoder accepts up to 5-megapixel captures from OMNIVISION's automotive image sensors, and outputs up to 2K resolution video at 30 frames per second (fps).

Boot-up time for the OAX8000 is significantly faster than its nearest competitor. This rapid startup eliminates any delay between ignition and activation of the DMS camera. Additionally, it supports secure boot features to provide cybersecurity.

Applications

- In-cabin DMS monitoring systems

Features

- Most optimized standalone DMS solution, with 1 TOPS of AI accelerator
- Ultra low power with fast boot up functionality
- RGB-IR ISP support for all in-cabin global shutter RGB-IR sensors with superior RGB color reproduction performance
- H.264 video compression engine to support in vehicle video communication

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