Hailo-15L AI Vision Processor

Top Image Quality & Advanced AI Analytics at an Attractive Cost for Mass Market Cameras



Overview

Hailo-15L AI Vision Processor delivers unprecedented image quality and advanced AI analytics and GenAI applications for mass market smart cameras, at a cost- and power-efficient system-on-a-chip (SoC). Integrating Hailo's patented, field-proven AI inference technology with state-of-the-art computer vision engines, it brings next-generation vision intelligence to more devices than ever before.

Highlights & Key Features

Superior Image Quality

- Premium 4K30 image quality with cutting edge traditional & AI-ISP pipeline and an advanced vision sub-system with High Dynamic Range (HDR) and Noise Reduction (NR) algorithms
- AI-powered vision processing for video image enhancement and noise reduction in extreme low-light conditions
- Industry leading DSP vision processing and high-quality video encoding
- Color preservation in day and night conditions down to 0.01 LUX (no IR LED needed)

Unparalleled AI Analytics

- Best AI performance at a standard camera power consumption & cost envelope
- A powerful Neural Network (NN) Core enabling processing of multiple advanced AI models in parallel, and detection of multiple objects per frame
- Enabling GenAI applications like VLM and LLM for on-camera smart search – free text search, indexing, and event triggering

Comprehensive Software Suite

- Optimized drivers, libraries, tools, and easy-to-use APIs for seamless use in smart cameras
- Out-of-the-box pipelines e.g., 4K30 Dynamic Privacy Mask (DPM) enabling manufacturers to develop custom pipelines
- Industry-standard frameworks delivered within a complete Yocto-based Linux distribution
- Field proven and trusted by >10,000 developers

Versatile and Robust Solution

- Low power consumption. Compatible with Type 1 Class 2 PoE cameras, eliminating the need for IR LED, or for Class 3 with complex AI pipelines
- 7 TOPS (Tera Operations Per Second) enabling both AI image enhancement and complex analytics pipelines
- Industrial grade SoC with a wide temperature range for indoor and outdoor installation
- A variety of interfaces for image sensors, data and memory
- Secure boot and secure debug with hardware accelerated crypto library, TrustZone, TRNG, and Firewall

System Usage

The Hailo-15 family of AI vision processors offers a variety of system on a chip (SoC) solutions for a wide range of smart cameras. Ranging in compute power from 7 to 20 TOPS, the Hailo-15 vision processors enable both superior image quality through both traditional and AI-ISP, as well as complex analytics and generative AI applications. An single board computer (SBC) form factor is available for evaluation purposes.

General Specifications

Application Processor sub-system

- Quad-core ARM™ A53 up to 1.1 GHz 10.1 kDMIPs

Vision sub-system

- ISP: up to 12MP resolution, 600 Mpixel/s pixel rate
- YUV and Bayer RGB (RAW)
- High Dynamic Range (**HDR**)
- Multi-stage denoising (2DNR, 3DNR, Chroma NR)
- Video Encoding (HEVC & AVC) H.265/H.264, multiple stream
- Electronic / digital image stabilization, lens shading & distortion correction, digital zoom, flip & rotate
- Hybrid processing of AI-ISP with traditional ISP for superior visual fidelity

High-performance NN core sub-system

- 7 TOPS
- Hailo's patented structure defined dataflow architecture
- Full software control for continuous capability upgrades

DSP vision processing sub-system

- Vector DSP, 256 MACs@ 750 MHz supports up to 380 GOPs

Memory Interfaces[1]

- LPDDR4 / 4x
- SPI, DSPI, QSPI, OSPI
- SDIO 3.0/eMMc5.1 (up to HS200)

Sensor Interfaces

- Video In: MIPI CSI, DVP 24 bit
- Video Out: MIPI DSI

Peripheral Interfaces

- PCIe Gen 3.0 x 2 lanes (Endpoint or RC)
- Ethernet 10/100/1000 Mbit/s (RMII / RGMII)
- USB3.1 Gen2 / USB2.0
- I2C (x4), I2S (x2 in, x2 out), SPI (x3 master, x1 slave)
- CAN

Security

- Secure boot
- Secure debug
- Hardware accelerated crypto library
- TRNG, Firewall

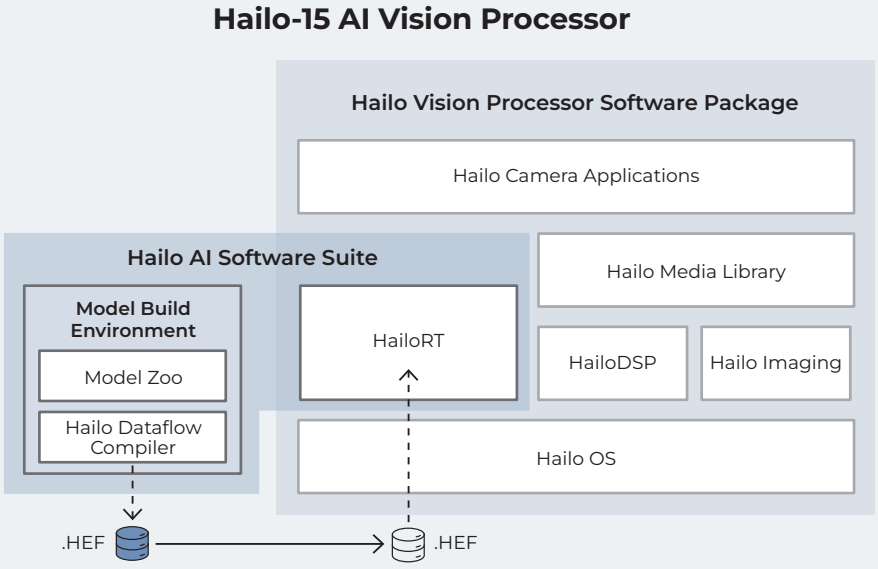
Physical

- Package: FCCSP 13x13 mm
- Operating temperature: -40°C to 85°C

(1) SPI, DSPI, QSPI, OSPI control up to 4 Flash devices.

Comprehensive Software Package

The vision processor software package includes a set of drivers, libraries and tools designed to develop smart cameras based on AI computer vision. It includes all the support for camera hardware interfaces and protocols, as well as specialized image- and video-processing algorithms and vision subsystem that are optimized for the requirements of camera-based applications. It is compliment by the AI Software Suite that enables the compilation, optimization, and deployment of NNs.



Part Number
Hailo-15L Industrial: HSB2LAI11JP

www.hailo.ai

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