AXELERA EMBEDDED 111c

With ARM-based RK3588

METIS

Security

Industry 4.0

Retail

Mobility

Logistics

Robotics

Medical

Hospitality

Utilities

Agritech

AXELERA®
ARTIFICIAL INTELLIGENCE

PROVEN IN KEY MARKETS

Companies in multiple market segments have already adopted Axelera Embedded 111c. What are they using it for?

AXELERA® EMBEDDED 111c OFFERS EFFICIENT AI COMPUTE FOR MULTI-STREAM COMPUTER VISION AND GENERATIVE AI APPLICATIONS IN A COMPACT DESIGN.

Security: reduce the time to detect and resolve incidents (abandoned baggage, intrusion, fall) thanks to high resolution, high throughput processing of tens of camera feeds.

Industry 4.0: improve accuracy and speed in defect detection and quality control. Increase worker safety with automated PPE control.

Retail: improve operational efficiency and customer experience with in-store customer behavior, stock monitoring and automated checkout systems.

Mobility: real-time vehicle detection, identification and tracking from multiple traffic cameras to enhances tolling, enforcement and parking management.

Logistics: monitor the movement of goods and personnel to improve operational efficiency and safety of logistic centers by improving resource allocation and detecting safety hazards.

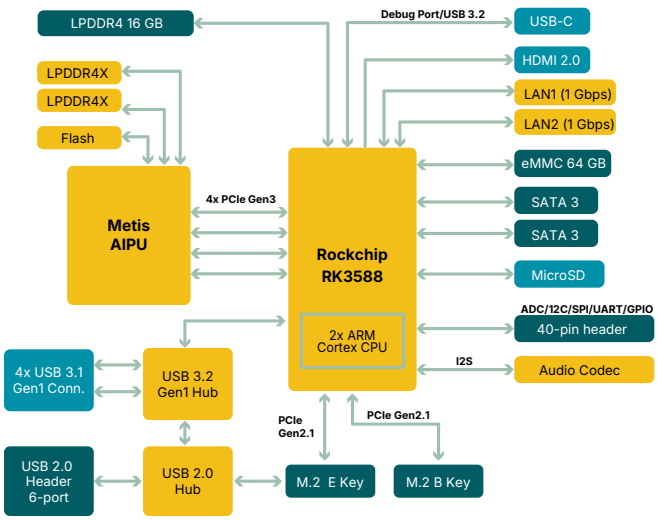
AXELERA EMBEDDED 111c - KEY FEATURES

- Local compute for Edge/IoT devices: Compact form factor SBC for low system complexity. With exceptional energy efficiency, the Axelera Embedded 111c is designed for devices at the Edge that require intense compute resources.
- ARM-based application processor: Powered by a quad-core Cortex-A76 and a quad-core Cortex-A55 for general-purpose processing, the board is powerful enough to support nearly any use case, while ensuring compatibility with diverse application requirements.
- Broad range of interfaces: Multiple connectivity options, including four USB ports, HDMI 2.0 port, and two gigabit LAN ports for networks and peripherals. Other interface capabilities include: UART, I2C, GPIO options make it simple to connect to and integrate with sensors and other peripherals.
- Complete development stack: Including a Board Support Package (BSP) and the Axelera® Voyager SDK the Axelera Embedded 111c makes a complete platform to accelerate deployment, reduce development overhead, and simplify system integration.

KEY TECHNICAL SPECIFICATIONS

Host CPU	RK3588 with 16 GB of LPDDR4
AI Accelerator	Metis AIPU with 4 GB or 16 GB of LPDDR4X
Storage	64 GB onboard eMMC, 2x SATA ports, MicroSD slot
Network	2x Gigabit LAN
Expansion Slots	1x M.2 E key, 1x M.2 B key
Other IO	GPIOs, UART, ADC, I2C, SPI
USB Ports	4x USB 3.1 Gen1, 1x USB-C, 3x USB 2.0 headers
Video Interfaces	HDMI 2.0, Display port (up to 4,096 x 2,160 @ 24 Hz)
Power Input	12 V DC input
Typical Application Power	9 - 20 W
Operating Temp	0 ~ 60°C
Thermal Solution	Active air cooling
Dimensions	mini-ITX 170x170 mm

BLOCK DIAGRAM



PERFORMANCE BENCHMARKS

See how Axelera Embedded 111c compares against other AI accelerators across real-world neural networks. Scan to view the latest results.

https://axelera.ai/axelera-products/embedded/111c

EASY TO INTEGRATE

The Axelera® SBC is designed as a complete system for effortless deployment. With a pre-configured Board Support Package (BSP) based on Yocto, it supports industry-standard frameworks and APIs, ensuring developers can hit the ground running. Complemented by the Voyager® SDK, the board simplifies AI model deployment and optimization, enabling fast prototyping and reduced time-to-market. Whether you're running TensorFlow, PyTorch, or ONNX models, the Voyager SDK provides the tools you need to get started quickly and scale confidently.

VOYAGER SDK

Thanks to Voyager Software Development Kit (SDK), users have a simple software integration path for AI inference at the edge:

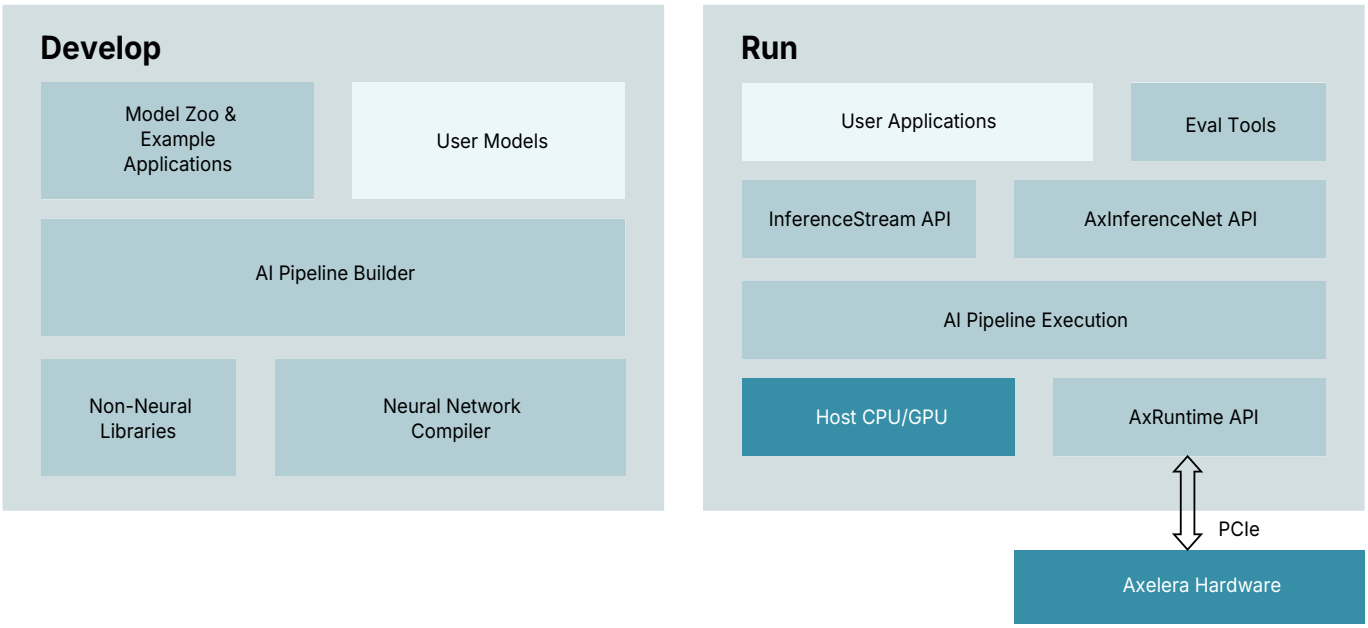
- **Great out-of-the-box experience:** The SDK's built-in tools and models allows evaluating Axelera performance, accuracy and power consumption in a few minutes.
- **Fast end-to-end integration path:** The SDK provides a high-level pipeline description framework that allows building optimized end-to-end AI applications with custom inputs, datasets, models and business logic with very few lines of code.
- **Low-level knobs and APIs:** For users that have their own pipelines and software infrastructure, the SDK includes low-level APIs to directly control the inference hardware.

Voyager is a simple yet feature rich SDK:

- Large Model Zoo supporting, among others:
  - Small Language Models (Phi3-mini, Llama-3.1 8B etc.)
  - Image Classification (EfficientNet, RestNet etc.)
  - Object Detection (YOLO models, RetinaFace etc.)
  - Semantic Segmentation (U-Net FCN)
  - Instance Segmentation (YOLO models)
  - Keypoint Detection (YOLO models)
- Compiler support for models from Pytorch and ONNX. The compiler automatically manages quantization and graph optimization without user intervention and achieves optimal performance and accuracy.

PyTorch ONNX

- Libraries including all pre- and post-processing required to run end-to-end pipelines: scaling; cropping; normalization; format conversion; non-maximal suppression (NMS) and more.
- A YAML description file is used to automatically generate the AI pipelines. The pipeline can then be run as a plugin to GStreamer or within an inference server.
- Built-in tools to test accuracy and performance of models running on Metis AIPU.



SCAN ME

Ordering information

Part numbers are listed in the product datasheet.

To order Axelera Embedded 111c please visit: store.axelera.ai/products

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