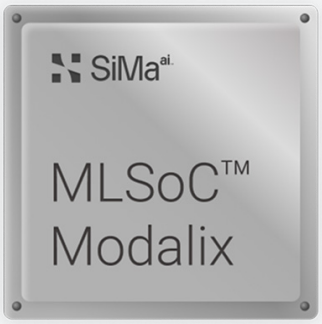
MLSoC™ Modalix SoM
(System-on-Module)

Product Brief



Overview

The MLSoC Modalix SoM combines the power and performance of the field-proven Modalix in a compact form factor designed to accelerate Edge AI deployments.

Modalix includes new peripherals and unique architecture that delivers best in-class performance per watt for multimodal Transformers, LLMs, LMMs, and GenAI workloads, while also supporting legacy CNN and computer vision algorithms.

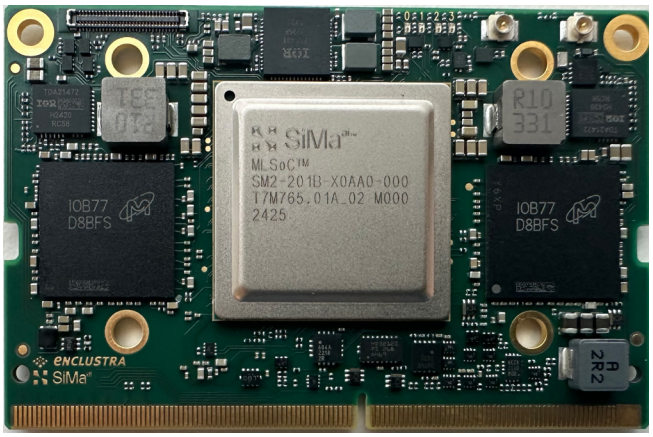
Customers gain access to a robust set of features, including:

- **Best-in-Class Processing:** A purpose-built MLSoC delivers 50 TOPS of compute power optimized for demanding edge AI workloads.
- **Adaptable Integration & Flexibility:** With extensive Input/Output options and a compact form factor, Modalix seamlessly integrates into a wide range of leading edge devices and systems.
- **Scalable Performance:** Advanced thermal management, real-time performance monitoring, and support for both commercial and industrial temperature ranges ensure reliable performance and power efficiency at the edge.
- **Accelerated Development:** SiMa.ai's ONE Platform for Edge AI development framework, featuring the Palette software suite and Edgematic, empowers customers to effortlessly build and deploy AI solutions at the edge. Built-in support for open standards—including Python, PyTorch, and OpenCV—allows developers to develop in their framework of choice.

Specifications

Target Industries

- Smart vision
- Drones
- Robotics (including AGV and AMR)
- Industry 4.0
- Automotive
- Smart Retail
- Healthcare
- Military & Government



MLSoC Modalix SoM Specifications

Machine Learning Accelerator (MLA)
- 50 TOPs (BF16, INT8, INT16)
- Neural networks, GenAI

Application Compute Unit (ACU)
- 8x Cortex-A65 @1.4 GHz
- 32k Dhrystone MIPS

Memory
- 32/8GB 128-bit LPDDR5 @ 6400 Mbps

Boot and Security Unit (BSU)
- Secure boot with authentication & encryption
- Secure key storage & management
- User code security API

Video Codec
- Decode H.264/H.265/AV1 4KP60 x1
- Encode H.264/H.265/ 4KP60 x1

Computer Vision Unit (CVU)
- 4-core Synopsys EV74 @ 1 GHz
- 720 16-bit GOPS

Image Signal Processor (ISP)
- ARM C-71 @ 1.2 GHz

Display
- 1x HDMI 1.4 4K

Peripherals

- 4x2 MIPI CSI-2
- 4x PCIe Gen5 RC & EP
- 1 x 1Gb Ethernet PHY
- 3 x USB 3.0
- 4 x I2C + 3 x UART + 16x GPIO
- 2 x SPI

Storage

- External NVMe through PCIe x4
- External SSD through USB 3.0
- 16 GB eMMC flash
- 64 MB QSPI flash
- 128Kb EEPROM

Power

- 5-20V power input

Temperature Range

- -40 to +85 °C

Form Factor

- 69.6 mm x 45 mm
- 260-pin SO-DIMM Connector

Software-First Development Environment

Compiling an ML-trained model for specific hardware can be challenging—especially when the software toolchain and hardware are not co-designed. SiMa.ai's software-first approach addresses this challenge through carefully defined intermediate representations (including TVM Relay IR) and innovative compiler optimization techniques. This software architecture allows SiMa.ai to support a broad range of frameworks—such as TensorFlow, PyTorch, and ONNX—and successfully compile over 250 models. The result is a seamless customer experience and industry-leading performance-per-watt. SiMa.ai's Palette™ software runs effortlessly on both the MLSoC and the MLSoC Modalix.

SiMa.ai's fully integrated hardware and software stack adapts to any framework, network, model, sensor, or modality all in ONE Platform. Edge ML applications running entirely on SiMa.ai's MLSoC achieve up to 10x higher performance and energy efficiency, bringing higher fidelity intelligence for ML use cases ranging from computer vision to generative AI in minutes. With SiMa.ai, customers unlock new revenue opportunities and drive significant cost savings, accelerating innovation at the edge across industries such as industrial manufacturing, retail, aerospace, defense, agriculture, and healthcare. Founded in 2018, SiMa.ai has raised $270M and is backed by Fidelity Management & Research Company, Maverick Capital, Point72, MSD Partners, VentureTech Alliance, and others. For more information, visit www.SiMa.ai.

About SiMa.ai

SiMa.ai is the software-centric, embedded edge machine learning system-on-chip (MLSoC) company.

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