Modalix SoM

Overview

The **MLSoC Modalix System-on-Module (SoM)** provides the proven performance of the Modalix MLSoC architecture in a compact, deployment-ready form factor, purpose-built to Scale Physical AI applications.

The Modalix **innovative system architecture** seamlessly integrates a set of compute engines and **peripherals**, delivering **best-in-class performance per watt** for advanced workloads, including **multimodal Transformers, Large Language Models (LLMs), Large Multimodal Models (LMMs),** and **Generative AI (GenAI)**. It also maintains full support for **legacy convolutional neural networks (CNNs)** and traditional **computer vision algorithms,** ensuring broad compatibility across both modern and established ML pipelines.

Accelerated Development

SiMa.ai's **ONE Platform™** enables fast AI development and deployment on device. With its user-friendly **Palette™ software suite** and **Edgematic**, users enjoy efficient, streamlined workflows.

Bring your ONNX model, tune it with SiMa's Model SDK and develop applications using popular frameworks like, OpenCV. Developers can iterate quickly and flexibly across various AI applications.

Benefits

Easy System Integration
The MLSoC Modalix SoM is pin-compatible with SoMs of leading GPU provider, allowing a seamless connection to existing carrier boards, eliminating any new hardware design.

Best-in-Class Processing
Modalix purpose-built MLSoC architecture is optimized for demanding Physical AI workloads, delivering 50 TOPS of computing power.

Scalable Performance & Easy to Use
The MLSoC Modalic SOM is available with 8GB and 32 GB LPDDR5 memory options, providing scalable performance and eliminating any HW design.

Reliable and Efficient
Available in industrial temperature grades with advanced thermal management, real-time performance monitoring, ensuring robust and reliable performance and power efficiency on device.

Target Applications

- Smart Vision
- Drones
- Robotics
- Industry 4.0
- Automotive

- Smart Retail
- Healthcare
- Military & Defense
- Smart City

MLSoC Modalix SoM Feature Highlights

Machine Learning Accelerator (MLA)
• 50 TOPs (BF16, INT8, INT16)
• Support of LLMs, Neural networks, and GenAI

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

Memory
• 32 or 8GB of on-board 128-bit LPDDR5(6400 Mbps)
  system memory

Boot and Security Unit (BSU)
• Secure boot with boot code authentication & encryption
• Secure key storage & management
• Security engine for user code

Video Codec
• Decode H.264/H.265/AV1 4K60
• Encode H.264/H.265/ 4K60

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

Low-latency Image Signal Processor (ISP)
• ARM Mali -C-1 @ 1.2 GHz

Display Connectivity
• HDMI 1.4 port with 4K resolution

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 + 14x 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

Flexible Power Supply
• 5-20V power input

Compact Form Factor
• 69.6 mm x 45 mm
• 260-pin SO-DIMM Connector
• Wide Temperature Range support
  • -40 to +85 °C

Software-First Development Environment

Compiling a 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 provides a software architecture that allows support for a broad range of ML models through the ONNX framework.

SiMa.ai's Palette™ software runs effortlessly on both the MLSoC and the MLSoC Modalix. With over 650 precompiled models, the software ensures a seamless user experience and provides industry-leading performance-per-watt. SiMa's effortless ML software framework supports any framework, network, mode, or sensor, allowing Physical AI applications to run entirely on a single device, supporting a broad range of applications.

Ordering Information

Product Name Description	Temperature Grade
Modalix SoM 8GB	Commercial & Industrial
Modalix SoM32 GB	Commercial & Industrial
Modalix SoM 32GBwith HDMI	Commercial & Industrial

About SiMa

SiMa.ai is a leader in Physical AI, delivering a purpose-built, software-centric platform that brings best-in-class performance, power efficiency, and ease of use to Physical AI applications. Focused on scaling Physical AI across robotics, automotive, industrial automation, aerospace & defense, smart vision, and healthcare, SiMa.ai is led by seasoned technologists and backed by top-tier investors. Headquartered in San Jose, California.
Learn more at **www.sima.ai**.