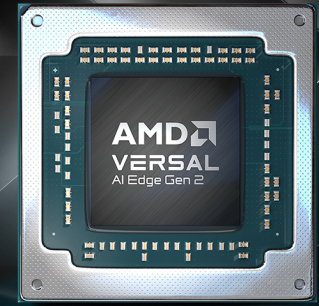


ACHIEVE REAL-TIME AI PERFORMANCE FOR VISION, SECURITY, AND RETAIL APPLICATIONS WITH AMD VERSAL™ AI EDGE SERIES GEN 2

SOLUTION BRIEF



OVERVIEW

Embedded software engineers grapple with numerous conflicting demands while crafting their applications. Their challenges encompass not only attaining real-time end-to-end performance for their applications, but also safeguarding model accuracy. Moreover, they must optimize for a variety of system requirements such as power, operating conditions, and more, all within the confines of demanding development schedules. Increasingly, they also encounter the need to interface with various sensors for data acquisition and actuators for control, which require real time data synchronization.

Versal™ AI Edge Series Gen 2 adaptive SoCs are designed to boost system-level performance for AI-driven applications with an enhanced processor system, power-optimized next-generation AI Engines, and world-class programmable logic from AMD for maximum flexibility and low-latency processing. System-level power efficiency is further augmented by the addition of integrated IP blocks, including video codec units (VCUs), image signal processors (ISP), and a GPU. The device architecture incorporates several high-speed and adaptable I/O interfaces. Reference designs facilitate real-time data synchronization and simplify the design process.

HIGHLIGHTS

UP TO 10X SCALAR COMPUTE WITH NEXT-GENERATION PROCESSOR SYSTEM¹

- Octal Arm® Cortex®-A78E with up to 200k DMIPs cores offer vital computational power to meet the growing demands of intensive workloads
- Up to additional 23k DMIPS in 10-core Arm Cortex-R52
- Leverages increased DDR bandwidth for higher performance on neural network inference and signal processing workloads

NEXT-GENERATION HIGH-PERFORMANCE AI ENGINES

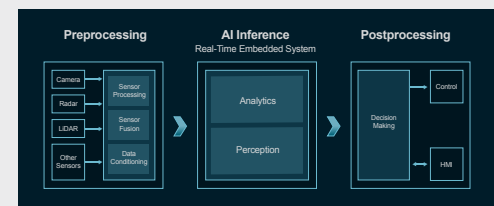
- Up to 3X TOPS/watt vs. previous generation²
- Adds support for MX6, MX9, FP8, and FP16 datatypes
- Leverages increased DDR bandwidth for higher performance on neural network inference and signal processing workloads

INTEGRATED VIDEO PROCESSING

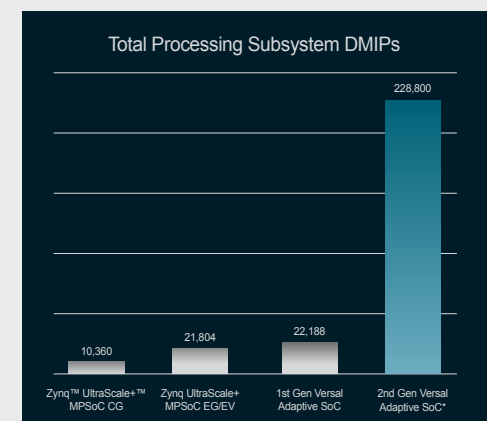
- Image signal processors (ISP)
- Video codec unit (VCU) for 4k60 HEVC/AVC³
- Graphics processing unit (GPU) with up to 256 GFLOPs

KEY BENEFITS

END-TO-END ACCELERATION IN A SINGLE DEVICE



UP TO 10X SCALAR COMPUTE FOR COMPLEX WORKLOADS¹



Source: AMD internal data, February 2024

*Pre-silicon estimated performance vs. previous generation

CONNECT TO ANY NUMBER OF STANDARD & PROPRIETARY SENSORS



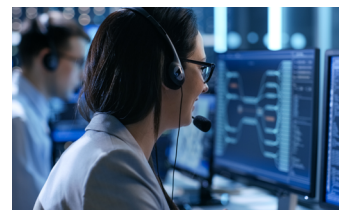
RAPID AI MODEL DEPLOYMENT

- Industry-standard frameworks such as PyTorch, TensorFlow, and ONNX
- Supports a broad range of models and operators including CNNs and ViT
- Comprehensive developer tools, training documentation, and reference designs
- Efficient AI inference – high throughput and low latency
- With AMD Unified AI Stack 2.0, AMD enables heterogeneous hardware environments across data center, edge, and endpoints

TARGET APPLICATIONS

SECURITY OPERATIONS AND FACILITY MANAGEMENT

Ensuring the safety and well-being of people at home, work, or in public is critical. Whether it involves optimizing parking management or bolstering security in public or residential areas, there is a rising demand for enhanced analytics in a compact device. The upgraded octal Arm Cortex-A78E processor system, specialized hardware engines spanning the complete video processing pipeline, and next-generation AI Engines make Versal AI Edge Series Gen 2 a powerful solution for embedded Edge AI applications.



SMART CITY TRANSPORTATION

City planning relies heavily on understanding traffic statistics and ensuring pedestrian safety for a more efficient transportation network. Obtaining reliable data under various outdoor conditions is crucial for informed decision-making. Many applications integrate different sensor inputs at the source to achieve accurate data synchronization. Versal AI Edge Series Gen 2 offers adaptable interfaces such as MIPI 4.0, Ethernet, USB 3.2, GMSL 3.0, and more, ideal for cameras, LiDAR, radar, ultrasound sensors, gantry actuators, and peripherals. Its flexible and high-performance I/Os efficiently collect and process sensor data using programmable logic, DSP slices, and block RAM, enabling synchronization at the endpoint for maximum accuracy.



SMART AGRICULTURE AND RETAIL

Determining the size and health of vegetables is crucial for identifying the optimal time for harvesting to maximize yield. Through the utilization of AI solutions and the integration of various sensors, machines can be empowered to accurately discern the readiness of fruits for harvest. With Versal AI Edge Series Gen 2 technology and its flexible I/O capabilities, connections to multiple sensors and controllers enable real-time motor control, facilitating efficient harvesting processes.



NEXT STEPS

- To learn more about Versal AI Edge Series Gen 2, visit www.amd.com/versal-ai-edge-gen2
- Contact your local AMD sales representative
- Watch for the Versal AI Edge Series Gen 2 SOM evaluation platform to kickstart your development journey



ENDNOTES

1. Based on AMD internal pre-silicon performance estimates for combined total DMIPs of the Versal AI Edge Series Gen 2 and Versal Prime Series Gen 2 processing system when configured with 8 Arm Cortex-A78AE applications cores @2.2 GHz and 10 Arm Cortex-R52 real-time cores @1.05 GHz, compared to the published combined total DMIPs of the processing system in the first-generation Versal AI Edge Series and Versal Prime Series. Versal AI Edge Series Gen 2 and Prime Series Gen 2 operating conditions: Highest available speed grade, 0.88V PS operating voltage, split-mode operation, maximum supported operating frequency. First-generation Versal AI Edge Series and Prime Series operating conditions: Highest available speed grade, 0.88V PS operating voltage, maximum supported operating frequency. Actual DMIPs performance will vary when final products are released in market. (VER-027)
2. Based on AMD internal performance and power projections for the AIE-ML v2 compute tile architecture in the Versal AI Edge Series Gen 2 using the MX6 data type, compared to performance specifications and AMD Power Design Manager power results for the AIE-ML compute tile architecture featured in the first-generation Versal AI Edge Series using INT8 data type. Assumptions: 2 row, 8 column sub-arrays. Operating conditions: 1 GHz F_{max}, 0.7V AIE operating voltage, 100°C junction temperature, typical process, 60% vector load, % activations = 0 < 10%. Actual performance will vary when final products are released in market. Performance projections as of March 2024. (VER-023)
3. Video codec acceleration (including at least the HEVC (H.265), H.264, VP9, and AV1 codecs) is subject to and not operable without inclusion/installation of compatible media players. (GD-176)

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