OVERVIEW

The Versal AI Edge series delivers 4X AI performance/watt vs. leading GPUs for intelligence in automated driving, predictive factory and healthcare systems, multi-mission payloads in aerospace & defense, and a breadth of other applications. More than just AI, the Versal AI Edge series accelerates the whole application from sensor to AI to real-time control, all with the highest levels of safety and security to meet the stringent functional safety requirements in IEC 61508 and ISO 26262, among others.

Versal AI Edge series allows developers to rapidly evolve their sensor fusion and AI algorithms while leveraging the world's most scalable device portfolio for diverse performance and power profiles from edge to endpoint.

HIGHLIGHTS

Architectural Innovation for Breakthrough AI Performance/Watt

> Optimized AI Engines-ML deliver 4X performance/watt vs. GPUs
> Native support for diverse ML data types: INT8, INT4, BFLOAT16
> 4MB on-chip accelerator RAM extends memory hierarchy for AI performance

Accelerates the Whole Application with the Highest Levels of Safety & Security

> Programmable I/O to integrate any sensor, any interface
> Adaptable Engines for sensor fusion and pre-processing
> Intelligent Engines for AI, vision processing, and radar & LiDAR processing
> Scalar Engines for embedded compute and real-time control
> Architected to meet IEC 61508 and ISO 26262 safety standards

World’s Most Scalable and Adaptable Portfolio from Edge to Endpoint

> Broadest device selection to scale from edge sensor to CPU accelerator
> Design once and scale with same architecture, tools, and certifications
> Scale for varying levels of compute safety & security targets
> Hardware adaptable for custom AI, vision, and sensor strategies

TARGET APPLICATIONS

ADAS AND AUTOMATED DRIVE

> Edge Sensor (e.g., radar, LiDAR, vision)
> Domain Controllers
> CPU Accelerator

COMPUTER VISION

> Edge AI Box
> Machine Vision Camera
> Security Camera

INDUSTRIAL

> Collaborative Robotics
> Converged Networking
> Industrial-Grade PC

MEDICAL

> Ultrasound
> Endoscopy
> CT Scanner
> Surgical Robotic Systems

AEROSPACE AND DEFENSE

> Unmanned Aerial Vehicles
> MILCOM Radio

1: Versal AI Edge VE2802 vs. Jetson AGX Xavier (MAX N-Mode), ResNet50 224x224, batch=1
FEATURES

FEATURES OVERVIEW

Scalar Engines
> Up to 1.7GHz dual-core Arm® Cortex®-A72 application processor for Linux-class operating systems
> Up to 750MHz dual-core Arm Cortex-R5F real-time processor with low latency and determinism
> Embedded compute for complex algorithms and highest levels of functional safety (ASIL & SIL)
> Platform management for quick boot, power & thermal management, and safety & security enclave

Adaptable Engines
> Scalable and adaptable sensor fusion for any combination of sensor or data types
> Adaptable for any workload, including deterministic networking, motor control, and signal conditioning
> Capable of over-the-air hardware updates to instantly update AI acceleration, sensor fusion algorithms, and more
> Dynamic Function Exchange (DFx) to swap functionality in milliseconds, reducing device cost and system power

Intelligent Engines
> AI Engines-ML (AIE-MLs) for low power and low latency inference, with native support for INT8, INT4, BFLOAT16
> C-programmable for software developers and library-based design for data scientists
> DSP Engines for diverse workloads including image signal processing, support for single-and half-precision floating point

Safety and Security
> Built to meet stringent safety and security standards including IEC 61508 and ISO 26262
> Security processing subsystem includes cryptographic acceleration, key management, and anti-tamper
> Safety measures across the platform, including triple redundant platform management, system monitoring, and ECC

Accelerator RAM
> 4MB of on-chip memory for high bandwidth memory access from any engine
> Optimizes AI performance by reducing the need for external memory
> Extends the platform’s adaptable memory hierarchy to optimize for system performance

Programmable I/O
> Hardened memory controller for DDR4-3200 and LPDDR4-4200
> Configure the same I/O for any sensor, network connectivity, or DDR interface
> Native MIPI support to handle up to 8 megapixel resolutions and beyond—critical to Level-2 ADAS and above

World’s Most Scalable Edge AI Platform

Total AI Compute (INT4) 13TOPS 18TOPS 37TOPS 53TOPS 221TOPS 124TOPS 431TOPS
Total AI Compute (INT8) 7TOPS 10TOPS 21TOPS 31TOPS 120TOPS 124TOPS 228TOPS
Adaptable Engines 20K LUTs 37K LUTs 105K LUTs 150K LUTs 375K LUTs 448K LUTs 520K LUTs
Total Memory 95Mb 103Mb 156Mb 172Mb 554Mb 253Mb 575Mb

Intelligent
Edge Sensor & End Point

Edge Aggregation & Autonomous Systems

Accelerator

TAKE THE NEXT STEP
For more information about the AMD Versal AI Edge series, visit https://www.xilinx.com/versal-ai-edge.

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