

# ACCELERATE DSP WORKLOADS WITH AMD VERSAL<sup>™</sup> ADAPTIVE SoCs

Versal AI Engines can improve performance and use 30% less dynamic power on average<sup>1</sup>

Explore where to place functions in Versal<sup>™</sup> adaptive SoCs to reduce dynamic power usage compared to traditional FPGAs and optimize system performance for compute-intensive workloads.

## **AMD Versal adaptive SoCs feature** programmable logic and vector arrays



### Improve total system performance by accelerating DSP

Functions that can run in parallel or as vectors typically perform more efficiently when implemented on Versal AI Engines.<sup>2</sup> Placing workloads where they run efficiently frees up programmable logic and DSP Engines, increasing total DSP compute, helping to improve energy efficiency, and delivering overall performance benefits.

#### **USE PROGRAMMABLE LOGIC FOR NON-LINEAR FUNCTIONS**

- Custom algorithms
- Deterministic operations
- Random access memory applications
- Data movement and data reordering

#### **USE VERSAL AI ENGINES FOR** LINEAR DSP FUNCTIONS

- Compute-intensive workloads
- Vector and parallel operations
- FIR and FFT filtering
- Speed and power efficiency

## **Program Versal AI Engines with the** AMD Vitis<sup>™</sup> development platform

With the Vitis platform, you can design, compose, and simulate programs for Versal AI Engines entirely in software. It's ideal for quick performance assessments before implementing on hardware.

## The Vitis platform offers two programming environments, leveraging DSP libraries, APIs, and intrinsics

#### Build in C/C++

The Vitis platform has open-source building blocks for common DSP algorithms, functions, and device graphs. Use them as is for rapid testing or customize them for your needs.

#### Drag and drop with Vitis Model Composer

The composer brings development into the MathWorks MATLAB<sup>®</sup> / Simulink<sup>®</sup> environment, where you can generate kernels for Versal AI Engines, integrate programmable logic modules, and simulate systems.

# **EVALUATE AI ENGINES** IN AMD VERSAL ADAPTIVE SoCs

## AMDA VERSAL

Versal AI Engines are available as options in several Versal adaptive SoCs:

Versal<sup>™</sup> AI Core Series | Versal<sup>™</sup> AI Edge Series | Versal<sup>™</sup> Premium Series

## **START DESIGNING**

Learn more about programming Versal adaptive SoCs, then experiment with shifting DSP algorithms and functions to Versal AI Engines.

## ACCESS BENCHMARKS

We benchmarked Versal adaptive SoC designs using AI Engines against programmable logic-only designs. To see the results and get the source code, please contact your FAE. If you don't have an AMD representative, please reach out.

**Dive Deeper** 

**Contact Sales** 

1. Based on 3rd party benchmark testing commissioned by AMD in February 2024, on the AMD Versal Adaptive SoC AI Engine and Vitis for AI design tool versus traditional programmable logic with Vivado software and Vitis Model Composer tools, version 2023.1, in a high-precision, high-complexity signal processing application FFT implementation. Results averaged over 5 designs. Results will vary depending on design specifications. (VER-036)

2. Ibid.

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