

SOLUTION BRIEF

NEXT-LEVEL BROADCAST AV PERFORMANCE WITH AMD VERSAL™ PRIME SERIES GEN 2

More compute, faster memory, and higher definition video



together we advance_

OVERVIEW

AMD Versal™ Prime Series Gen 2 adaptive SoCs deliver the performance and efficiency needed for multi-channel live video production, AV network control, multi-channel 4K and 8K LED wall processing, and software-defined broadcast workflows. As a result, Versal Prime Series Gen 2 adaptive SoCs are a logical choice when upgrading from the AMD Zynq™ UltraScale+™ MPSoC family, widely used across the Broadcast and Pro AV industries today.

HIGHLIGHTS

HIGHER PERFORMANCE ARM® PROCESSING SYSTEM

Delivers up to 10X scalar compute uplift from the quad-core Arm Cortex®-A53 processor used in Zynq UltraScale+ MPSoCs.¹

FASTER CONNECTIVITY SPEEDS

In the processing system (PS), high-speed transceivers support up to USB 3.2 Gen2 @10 Gb/s (up to 2X bandwidth improvement), 10G Ethernet (up to 10X bandwidth improvement), and PCIe® Gen5x4. In the programmable logic (PL), PCIe Gen5 & 10G/25G/50G/100G Ethernet are implemented as hard IP blocks, offering up to 4X the throughput per PCIe lane and democratizing high-speed Ethernet connectivity across the entire device series.

IMPROVED VIDEO & GRAPHICS HANDLING

Integrated as hard IP blocks in the PS, a display controller, DisplayPort™ 1.4 transmitter, and Arm Mali™ G78 GPU offer a substantial upgrade from the Zynq UltraScale+ MPSoC, with up to 4X increase in video throughput (from HD to 4K) and up to 50X improvement in the rendering of 3D graphics.²

MORE MEMORY BANDWIDTH

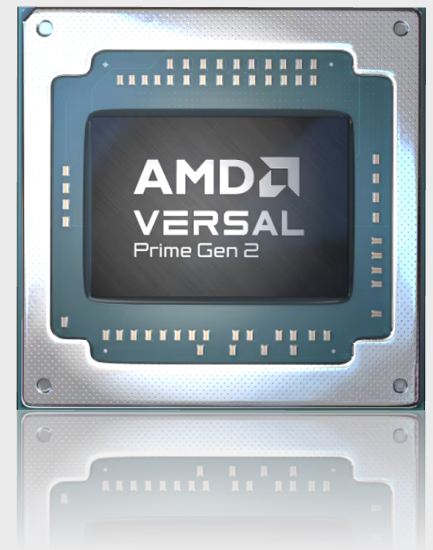
Up to five 32-bit LPDDR5X-8533 controllers offer up to 170 GB/s of memory bandwidth (a 10X increase from Zynq UltraScale+ MPSoCs), enabling higher video channel density. Multi-channel designs benefit from the programmable network on chip (NoC), which offers lower latency and reduces the PL resources required.

INTEGRATED VIDEO CODECS

Dedicated H.264/H.265 video codec units (VCUs) support 4:4:4 12-bit simultaneous encoding and decoding, with select devices offering up to two VCUs for increased streaming density. In addition, the Versal Prime Series Gen 2 provides compatibility with a range of leading lightweight mezzanine codecs—implemented in the PL through collaboration with industry partners—making it a highly adaptable and scalable solution for managing compressed AV content.

KEY BENEFITS

- Faster Compute Speeds
- Better Graphics and Video
- Supports More UHD Channels
- Higher Density Streaming



AMD SoC UPGRADE PATH

FEATURES	 AMD ZYNQ UltraScale+	 AMD VERSAL Prime Gen 2
PS COMPUTE	Dual/Quad Arm Cortex-A53 (up to 1.5 GHz) Dual Arm Cortex-R5F (up to 600 MHz)	Quad/Octal Arm Cortex-A78 (up to 2.2 GHz) Hex/Deca Arm Cortex-R52 Up to 10X Scalar Compute Performance¹
PS VIDEO & GRAPHICS	DisplayPort 1.4 Tx @ 4K30 (2x 5.4 Gb/s) Arm Mali-400 MP2 GPU Display Controller (Overlay, CSC, etc.)	DisplayPort 1.4 Tx @ 8K30 (4x 8.1 Gb/s) Single or Quad Arm Mali-G78AE GPU Display Controller (Overlay, CSC, etc.) Higher Resolution DisplayPort and Graphics
VIDEO CODECS	Dedicated H.264/H.265 4:2:2 10-bit VCU (EV Devices Only)	Dedicated H.264/H.265 4:4:4 12-bit VCU (All Devices) Improved H.264/H.265 Capabilities
PS CONNECTIVITY	10/100/1000M Ethernet USB 3.0 @ 5 Gb/s (no PHY)	1G/2.5G/5G/10G Ethernet USB 3.2 Gen2 @ 10 Gb/s (inc. PHY) PCIe Gen5x4 Up to 10X Connectivity Bandwidth
PL CONNECTIVITY	Dedicated 100G Ethernet (No Dedicated Ethernet + VCU Options) PCIe Gen3x16	Dedicated 10G/25G/50G/100G Ethernet (Dedicated Ethernet + VCU on All Devices) PCIe Gen5x4 Programmable NoC Up to 4X Connectivity Bandwidth
MEMORY INTERFACING	Processing System: LPDDR4-2400 (9.6 GB/s) or DDR4-2400 (19.2 GB/s) Programmable Logic: DDR4-2667 (up to 64 GB/s)	Unified PS & PL via Programmable NoC: LPDDR5X-8533 (up to 170 GB/s) or DDR5-6400 (up to 128 GB/s) Up to 10X Memory Bandwidth

THE OBVIOUS CHOICE FOR YOUR NEXT BROADCAST AV DESIGN

While AMD Zynq UltraScale+ MPSoC handles the 4K AV designs of today, it's clear that AMD Versal Prime Series Gen 2 adaptive SoCs offer the right balance of high-performance compute processing and AV throughput required for next-generation Pro AV and Broadcast equipment that need to handle higher resolutions and more channels. Integrated hard IP cores supporting professional-grade H.264/H.265 codecs, 10G/25G/100G Ethernet for AV-over-IP, PCIe Gen5 for capture/processing/playout cards, and enhanced video and graphics capabilities in the processor system mean that AMD Versal Prime Series Gen 2 is the obvious choice for your next design platform, with room to innovate and differentiate through both software and programmable logic hardware.

AMD VERSAL PRIME SERIES GEN 2 ADAPTIVE SoC FEATURES

FEATURE	HIGHLIGHTS
PROCESSING SYSTEM (PS) OF INTEGRATED CPUs	<ul style="list-style-type: none"> Up to 8x Arm Cortex-A78AE application processors – up to 200k DMIPs Up to 10x Arm Cortex-R52 real-time processors Support for USB 3.2, DisplayPort 1.4, 10G Ethernet, PCIe Gen5, and more
PROGRAMMABLE LOGIC (PL)	<ul style="list-style-type: none"> Low-latency, deterministic, parallel processing Fully customizable to enable differentiated, proprietary algorithms Field-upgradeable: Adaptable to changing conditions and evolving workloads
VIDEO CODEC UNIT (VCU)	<ul style="list-style-type: none"> Each VCU tile offers hard IP for encoding & decoding Support for HEVC & AVC up to 4K60, 4:4:4, 12-bit Up to two VCU tiles per device; aggregate both tiles for limited 8k30 support
INTEGRATED GPU	<ul style="list-style-type: none"> Up to 4-core Arm Mali-G78AE GPU with up to 268 GFLOPs of compute (FP32 MACs) Up to 4 shader cores in 2 slices – configurable as 1 or 2 independent partitions Support for: OpenGL® ES 3.2, OpenGL SC 2.0, Vulkan® 1.2, Vulkan SC, OpenCL™ 3.0
DDR5/LPDDR5X MEMORY CONTROLLERS	<ul style="list-style-type: none"> Support for DDR5 @ 6400 Mb/s and LPDDR5X @ 8533 Mb/s Up to 170 GB/s memory bandwidth in the largest devices Flexible pin planning – swap hard controller pins to support other interfaces
PROGRAMMABLE I/O	<ul style="list-style-type: none"> New high-performance X5IO support DDR5/LPDDR5X, LVDS, and other standards New MIPI C-PHY support (4.5 GSPS) to complement 4.5 Gb/s D-PHY support HDIO and MIO support lower speeds and logic levels up to 3.3V
NETWORK ON CHIP (NoC)	<ul style="list-style-type: none"> High-bandwidth software-programmable network on chip Data movement alternative to PL-based routing Assured quality of service (QoS) to prioritize critical traffic
HIGH-SPEED SERIAL TRANSCEIVERS	<ul style="list-style-type: none"> Production-proven 32G GTYP transceivers Up to 24 PL-facing transceivers per device 8 additional PS-facing transceivers per device for PS-based 10 GbE, PCIe Gen5
100G MULTIRATE ETHERNET	<ul style="list-style-type: none"> Channelized for 1x100 GbE, 2x50 GbE, 1x40 GbE, 4x25 GbE, or 4x10 GbE Integrated FECs for robust error correction (KR FEC, KR4 FEC, KP4 FEC) FEC bypass mode for custom use
PCIe GEN5	<ul style="list-style-type: none"> PL-based support for PCIe Gen5x4, Gen4x8, and other configurations PCIe controller hard IP blocks integrated into programmable logic Up to 4 PL-based controllers per device; additional PCIe Gen5 controllers in PS

ADAPT TO CHANGING REQUIREMENTS

Optimize systems anytime without the need for new hardware. With AMD Versal Prime Series Gen 2 devices, designers have the flexibility to fine-tune systems for specific applications—even after deployment. Quickly customize 4K and 8K video pipelines, adapt to emerging AV-over-IP standards, embrace edge AI processing to differentiate your product, and update algorithms as workloads evolve. Take video, control, and software-defined multimedia applications to the next level with adaptive SoCs, built to perform in embedded environments.

NEXT STEPS

- Explore a list of **IP in Pro AV and Broadcast systems** offered through AMD & partners
- Learn more about **AMD in Professional AV and Broadcast**
- Learn more about **AMD Versal Prime Series Gen 2** adaptive SoCs

ENDNOTES

1. Based on the combined total DMIPs of the Versal AI Edge Series Gen 2 and Versal Prime Series Gen 2 processing systems 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 systems in the Zynq UltraScale+ MPSoC. 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. Zynq UltraScale+ MPSoC operating conditions: Highest available speed grade, 0.9V PS operating voltage, maximum supported operating frequency. Actual DMIPs performance will vary when final products are released in market. (VER-105)
2. Based on AMD comparison of the published peak performance values and Vertex processing rates at a 400 MHz operating frequency for Versal Prime Series Gen 2 and Zynq UltraScale+ MPSoC devices, as of August 2025. Performance result is subject to change with operating frequency and will vary by device. (VER-103)

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