KRIA™ K24 SYSTEM-ON-MODULE
Smaller form factor SOM for cost-sensitive and power-efficient applications

OVERVIEW

The AMD Kria™ K24 SOM is a smaller form factor product in the Kria portfolio that offers a faster path to volume production deployment compared to chip-down. It offers whole application acceleration at the edge and is optimized for power-efficient motor control and DSP applications. It is highly adaptable from both a hardware and software standpoint and enables future proofing against evolving standards, algorithms, and sensor requirements. The K24 SOM is connector compatible with the K26 SOM, which makes migration easier and allows customers to tune for the right power, cost, and performance without modifying their PCB.

Based on the AMD Zynq™ UltraScale+™ MPSoC architecture, the K24 SOM offers lower latency and is highly deterministic. With 132 I/Os available to users, it can connect up to three medium sized BLDC motors with encoders and provides TSN-enabled networking through 4x 1G Ethernet (2x PS GEM, 2x PL GEM). The resulting platform is highly scalable with many possible end applications and is expandable for evolving system requirements. It also offers enhanced security features through the Zynq UltraScale+ MPSoC's hardware root of trust and a discrete TPM 2.0 device.

The K24 SOM is available in commercial and industrial grades, built for volume edge deployment. Developed with ease of use in mind, the K24 SOM is out-of-the-box ready through the KD240 Drives Starter Kit and enabled by pre-built accelerated applications for common motor control/DSP functions. All types of developers with different levels of FPGA experience can accelerate their time to market and move faster from development to deployment.

HIGHLIGHTS

Build Power Efficient DSP Solutions
- High level of determinism, reliability, and security features via Zynq UltraScale+ MPSoC
- Up to 2X lower latency in single axis drives applications vs. Texas Instruments AM64xx standard SoC[1]
- Ability to connect multiple motor and drives stage technologies for power-efficient compute
- About half the size of a credit card for low power consumption

Deploy Scalable & Adaptable Systems
- Connector compatibility with Kria K26 SOM for scalability
- Adaptable to a plethora of sensor and peripheral support
- Over-the-air software updates and adaptable hardware for evolving standards
- Ruggedized for long lifecycle operation in harsh industrial environments

Enable Easy Signal Processing for Fast Development
- Ready-to-use KD240 Drivers Starter Kit with latest Ubuntu support
- App store with customizable pre-built accelerated applications for common motor control/DSP applications
- New Vitis™ accelerated libraries for motor control application development
- Expanding development flows to Python and the MATLAB® Simulink® environment

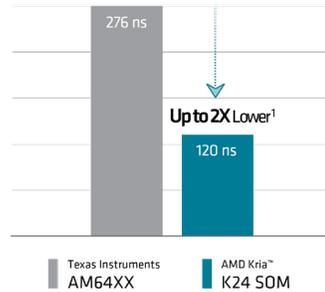K24 SOM pictured with fully enclosed thermal solution

KEY APPLICATIONS

- Industrial Motor Control
- Drive Stages
- Healthcare/Medical Devices
- Ethernet Gateways
- EV Charging Stations
- Multi-axis Robots
- Factory Automation
- Industrial IoT and Smart Sensors
- Aerial Systems
- Smart Home Appliances
- Industrial Communications and Networking

	K24 C-GRADE	K24 I-GRADE
Operating Temperature Range	0°C to 85°C	−40°C to 100°C
ECC Memory Support	No	Yes
Warranty	2 Years	3 Years
Operating Lifetime	5 Years	10 Years
Product Availability	10 Years	10 Years

BENCHMARKS

Latency Advantage
Single Axis Drives Application

276 ns

Up to 2X Lower[1]

120 ns

Texas Instruments AM64XX | AMD Kria™ K24 SOM

Power Advantage over GPU-Based Solutions

15W

10W

Up to 4-6X Lower[2]

2.5W

NVidia Jetson TX2 | NVidia Jetson Nano | AMD Kria™ K24 SOM

SPECIFICATIONS

COMPUTE

Application Processor	Quad-core Arm® Cortex®-A53 MPCore™ at 1.3 GHz
Real-time Processor	Dual-core Arm Cortex-R5F MPCore at 553MHz
Graphics Processor	Arm Mali™-400 MP2 at 600 MHz
Programmable Logic	154K system logic cells
Deep Learning Processor	INT8 (852 GOPs with B2304 DPU)
Memory	9.4 Mb on-chip SRAM[3]
Security Features	IEC 62443 standard with hardware root of trust (RSA, AES, and SHA)

SOM FEATURES

Form Factor	60 x 42 x 11 mm
Connectors	1x 240-pin and 1x 40-pin connectors
Memory Interface	2 GB 32-bit LPDDR4 @ 1066 Mbps w/ ECC configuration[4]

INTERFACE CAPABILITY[5]

Network	Up to 4x 1 Gbps Ethernet (2x PS GEM, 2x PL GEM)
Motor Drive & Control	Three-phase inverters, Quadrature encoder, Brake control, Torque sensor interface
USB	2x USB 2.0 / 3.0
Connectivity	CAN, RS-485, Pmod, Raspberry Pi header

TAKE THE NEXT STEP

• For more information about Kria K24 SOMs, visit www.amd.com/k24

1: Based on AMD internal analysis in August 2023, using the latency results reported by TI for a full control loop implementation on a Texas Instruments AM64xx standard SOC using a Texas Instruments benchmark vs. the latency results of a full control loop implementation using a Field Oriented Control algorithm designed by Qdesys. System configuration for the TI AM64xx SOC system: TMDS64EVM board; configuration for the Kria K24 SOM system: KD240 starter kit. The latency advantage improves up to 7x as the number of motor axes increases. Actual results will vary. (SOM-003)
2: Based on AMD Labs testing in August 2023, measuring the default/idle power for the Kria K24 SOM using the xmutil platform utility tool while loading a bitstream to boot the SOM (2.5W) and comparing the results to published idle/default power specs for the NVIDIA Jetson Nano (10W) and the NVIDIA Jetson TX2 (15W). Results may vary. (SOM-004)
3: Total of max. distributed RAM & total block RAM
4: ECC configuration only available on I-grade SKU
5: The Zynq UltraScale+ MPSoC device on the SOM has capability to support a suite of peripherals but the end user carrier must be designed to support these capabilities as these are not connectors on the SOM

DISCLAIMERS