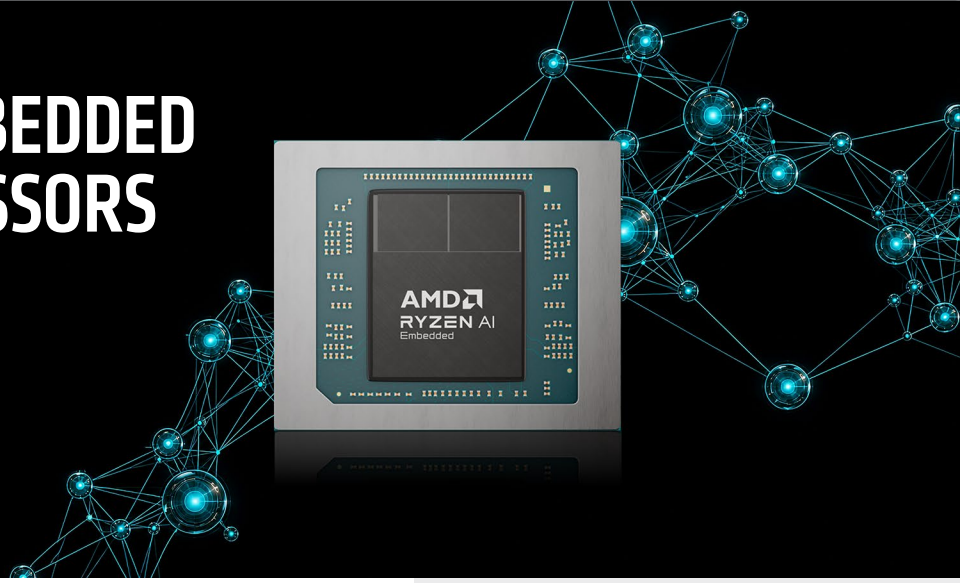
# AMD RYZEN™ AI EMBEDDED X100 SERIES PROCESSORS

PRODUCT BRIEF

AMD RYZEN AI Embedded




## OVERVIEW

AMD Ryzen™ AI Embedded X100 Series processors deliver leadership heterogeneous integration by combing a high-performance x86 CPU, a discrete-class, integrated GPU, and low-power NPU in a single embedded SoC. While each compute engine delivers exceptional standalone performance, a unified, zero-copy memory architecture accelerates real-world workloads for increased determinism and low latency.

Ryzen AI Embedded processors provide developers with flexibility without lock-in, through an open software ecosystem spanning EDKII, Linux, Xen Hypervisor, ROS2, ROCm™, Ryzen AI Software and industry-standard AI frameworks like PyTorch, ONNX, and Tensorflow.

Designed for the most demanding use-cases across robotics, healthcare, aerospace & defense, and interactive entertainment, X100 Series is ideal for embedded environments with industrial temperature range options, extended 24/7 reliability modes, and a 10-year production lifecycle.

## HIGHLIGHTS

### LEADING PERFORMANCE AND INTEGRATION VS. COMPETITION

- Up to 16 cores "Zen5" CPU w/ AVX-512 deliver up to 2.1X nT performance[1]
- Up to 40 Compute Unit integrated GPU expected to deliver 1.7X faster graphics[2]
- Unified Memory Architecture with up to 273 GB/s w/ LPDDR5x-8533 MT/s
- Minimize size, weight, and power by eliminating the need for a discrete GPU

### BUILT FOR PHYSICAL AI AND INTELLIGENT EDGE

- Unified architecture for up to 3.4X better real-time reliability vs. NVIDIA Thor[3]
- Delivers 1.3X throughput for Frontier and Foundational models vs Nvidia Orin[4]
- Run models up to 200B+ parameters with up to 128 GB external memory
- Real-time, deterministic performance through RT BIOS and Linux RT Kernel
- Up to 29.7 TFLOPS FP32 for DSP acceleration, powered by ROCm math libraries

### ACCELERATE PRODUCTIVITY WITH OPEN SOFTWARE

- ROCm and Ryzen AI Software enable reuse without vendor lock-in
- Optimized AI models spanning robotics, medical, industrial, and more
- Robotics Software Suite with ROS2 and accelerated libraries
- Easy migration from CUDA to AMD HIP C++ (open-source)

## KEY APPLICATIONS

**ROBOTICS**
Industrial Robots & Cobots
AMRs
Humanoids

**INDUSTRIAL**
Industrial PCs
Machine Vision
Smart Retail

**HEALTHCARE**
Surgical Robotics
Diagnostic Imaging

**AEROSPACE & DEFENSE**
Unmanned Systems
Sensor Signal Processing

**INTERACTIVE ENTERTAINMENT**
Gaming Machines
Sports Analytics

**NETWORKING AND STORAGE**
Routing & Switching AI Acceleration
AI Network Attached Storage (NAS)

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# AMD RYZEN AI EMBEDDED X100 SERIES PROCESSOR PRODUCT TABLE

| | | | | | INDUSTRIAL TEMP | | |
|---|---|---|---|---|---|---|---|
| | Model # | X168 | X188 | X199 | X168i | X188i | X199i |
| CPU | "Zen 5" CPU Cores / Threads | 8 /16 | 12 /24 | 16 /32 | 8 /16 | 12 /24 | 16 /32 |
| | Max Frequency | 5 GHz | 5 GHz | 5.1 GHz | 5 GHz | 5 GHz | 5.1 GHz |
| | L3 Shared Cache | 32 MB | 64 MB | 64 MB | 32 MB | 32 MB | 64 MB |
| GPU | Compute Units | 32 | 32 | 40 | 32 | 32 | 40 |
| | 4K120 / 8Kp120 Displays | 4 / 2 | 4 / 2 | 4 / 2 | 4 / 2 | 4 / 2 | 4 / 2 |
| | GPU Max Frequency | 2.8 GHz | 2.8 GHz | 2.9 GHz | 2.8 GHz | 2.8 GHz | 2.9 GHz |
| NPU | TOPS | 50 | 50 | 50 | 50 | 50 | 50 |
| I/O | PCIe® Gen4 | 16-Lane | 16-Lane | 16-Lane | 16-Lane | 16-Lane | 16-Lane |
| | LPDDR5x (ECC) 256-Bit | 8533 MT/s | 8533 MT/s | 8533 MT/s | 8533 MT/s | 8533 MT/s | 8533 MT/s |
| | USB 4.0 | 2x USB 4 (Type-C), 1x USB 3.2 (Type-C, 1x USB 3.2 (Type-A), 3x USB 2, 1x USB 3.2 | | | | | |
| Display Support | | Up to 5 ports eDP, DP2.1, USB4, HDMI2.1, DVI | | | | | |
| Power & Thermal | Nominal TDP | 55 W | 55 W | 55 W | 55 W | 55 W | 55 W |
| | TDP Range | 45-120 W | 45-120 W | 45-120 W | 45-120 W | 45-120 W | 45-120 W |
| | Junction Temperature | 0 to 105°C | 0 to 105°C | 0 to 105°C | -40 to 105°C | -40 to 105°C | -40 to 105°C |
| Package & Reliability | Package | 37.5mm x 45mm | | | | | |
| | Reliability (Standard \| Extended) | 2.5 Years (Standard) \| Up to 10 Years (Extended) | | | | | |

## SUMMARY

AMD Ryzen™ AI Embedded X100 Series processors combine a high-performance "Zen 5" x86 CPU, a discrete-class integrated GPU, and a low-power NPU in a single rugged SoC with unified, zero-copy memory for deterministic, low-latency physical AI. Scalable performance, an open ROCm™ and Ryzen™ AI software ecosystem, and industrial-grade reliability make them ideal for real-time intelligent systems across robotics, healthcare, aerospace & defense, and interactive entertainment. Evaluate the X100 Series today and get started building your next generation of intelligent systems.

### ENDNOTES

1. Measurements and projections conducted by AMD as of May 2026 on an AMD Ryzen AI Max+ 395 processor (OPN 100-000002199) configured to reflect Ryzen AI Embedded X199 specifications (AMD Maple CRB, 5.1 GHz CPU, 2.9 GHz GPU, with sustained operation at 45W TDP/sPPT/fPPT, STAPM disabled and 64 GB soldered LPDDR5X-8000), compared to an Intel Core Ultra X7 358H (MSI Prestige 16 Flip AI+ C3MTG MS-2622, 5.1 GHz CPU, 2.5 GHz GPU, PL1 = 45W, PL2 = 64W, MSI BIOS E2622IMS.10E, 32 GB LPDDR5X-8533, measured 30W OEM Sustained Power Limit). Results reflect projected relative CoreMark v1.01 multi-thread performance on Ubuntu 24.04, comparing measured AMD performance at 45W sustained power to 45W Intel performance projected from 30W sustained power measurements, using scaling factors derived from public benchmark data for the 358H. System manufacturers may vary configurations, yielding different results. Results may vary based on configuration, settings, usage, and other factors. (REX-007)

2. Measurements and projections conducted by AMD as of May 2026 on an AMD Ryzen AI Max+ 395 processor (OPN 100-000002199) configured to reflect Ryzen AI Embedded X199 specifications (AMD Maple CRB, 5.1 GHz CPU, 2.9 GHz GPU, with sustained operation at 45W TDP/sPPT/fPPT, STAPM disabled and 64 GB soldered LPDDR5X-8000), compared to an Intel Core Ultra X7 358H (MSI Prestige 16 Flip AI+ C3MTG MS-2622, 5.1 GHz CPU, 2.5 GHz GPU, PL1 = 45W, PL2 = 64W, MSI BIOS E2622IMS.10E, 32 GB LPDDR5X-8533, measured 30W OEM Sustained Power Limit). Results reflect the relative geomean of offscreen OpenGL frame rates from GFXBench 5.0.0 on Ubuntu 24.04, comparing measured AMD performance at 45W sustained power to 45W Intel performance projected from 30W sustained power measurements, using scaling factors derived from public benchmark data for the 358H. System manufacturers may vary configurations, yielding different results. Results may vary based on configuration, settings, usage, and other factors. (REX-003)

3. Based on the OpenNav Robotics Workload Benchmark commissioned by AMD, published by Open Navigation LLC on July 23, 2026, as measured on the GMKtec EVO-X2 AI Mini PC AMD Ryzen AI Max+ 395 configured to reflect Ryzen AI Embedded X199 specifications (5.1 GHz CPU, 2.9 GHz GPU, 120W TDP, LPDDR5X-7500), vs. the NVIDIA Jetson AGX Thor Developer Kit: https://opennav.org/news/opennav-robotics-workload-benchmark (REX-018)

4. Based on AMD internal testing as of May 2026, an AMD Ryzen AI Max+ 395 processor system—configured to reflect Ryzen AI Embedded X199 specifications (5.1 GHz CPU, 2.9 GHz GPU, 55W TDP with sustained operation at 55W TDP/sPPT/fPPT, and LPDDR5X-8533) was used to measure projected inference throughput. Results are compared against a similarly configured NVIDIA AGX Orin 64 GB at 60W TDP and reflect the geometric mean of performance across GR00T N1.5, SmolVLA, Pi0 DROID, Pi0.5 DROID, and OpenVLA models using FP16 quantization. System manufacturers may vary configurations, yielding different results. Results may vary based on configuration, settings, usage, and other factors. (REX-001)

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