



Product Brief: AMD Ryzen™ Embedded R2000 Series

Next-Generation R-Series SoCs Deliver Optimal Performance and Power Efficiency with Radeon™ Graphics and Versatile Multi-Display Configurability

Product Overview

The AMD Ryzen™ Embedded R2000 Series boosts the mid-range processor portfolio to new heights for a new generation of industrial systems and thin clients requiring an optimal performance-per-watt balance, complemented with AMD Radeon™ graphics for rich, versatile multimedia capabilities. New AMD Ryzen™ Embedded R2000 Series SoCs provide up to 2X I/O connectivity¹ and CPU core count² compared to legacy R-Series SoCs, with expanded multi-display configurability for industrial PCs, HMIs, thin clients, Mini PCs and more.

Built for Scalability

Featuring the AMD “Zen+” CPU and Radeon™ GPU architectures, AMD Ryzen™ Embedded R2000 Series SoCs are scalable up to four CPU cores/eight threads and up to eight graphic compute units (CUs) to meet a diverse range of performance requirements. This equips embedded system designers with greater agility to scale the performance and power efficiency of their product portfolios, addressing use cases from simple to complex with one unified processing platform. Operating system support has been expanded to include Microsoft Windows® 11 for a rich ecosystem of tools and capabilities optimized for x86 environments.

With low thermal design power (TDP) profiles spanning from 12W to 54W, AMD Ryzen™ Embedded R2000 Series SoCs provide thermal agility for compact system designs to help streamline design efficiencies and BOM costs. They provide enhanced performance and connectivity while maintaining pin-to-pin package compatibility and a common software foundation with legacy AMD Ryzen™ Embedded R1000 and V1000 Series SoCs.

Target Markets



Industrial & Robotics



Thin Client



Machine Vision



IoT

Brilliant 4K Graphics Resolution and Multi-Display Configurability

A single, small-footprint AMD Ryzen™ Embedded R2000 SoC can power up to four independent displays in crisp 4K resolution leveraging DisplayPort™ 1.4, HDMI™ 2.0b, or eDP 1.3 interfaces, each supporting up to 4K60 resolution. For industrial PC and thin client solutions, AMD Ryzen™ Embedded R2000 SoCs help enable versatile display and HMI configurations in space and thermally constrained environments. Multimedia Hardware Accelerator supports decode or encode for select widely used video codecs with resolutions up to 4K: HVEC & VP9 10-bit decode, H.264 8-bit decode and HVEC & H.264 8-bit encode³.

Ample Memory and I/O Connectivity

AMD Ryzen™ Embedded R2000 SoCs are optimized to enable improved memory agility and 2X greater I/O connectivity compared to legacy R-Series SoCs. These SoCs provide support for up to 16 lanes of PCIe® Gen3 connectivity to accommodate a broad range of I/O requirements. Equipped with fast (up to 3200 MT/s) DDR4 dual-channel memory support, AMD Ryzen™ Embedded R2000 Series SoCs support rapid memory transfer speeds.

Model	Nominal TDP (cTDP Range)	Core/Thread Count	Base CPU Freq.* (GHz)	1T Boost CPU Freq.* (GHz) (up to) ⁴	GPU Compute Units* (SIMD)	Max GPU Freq.* (GHz)(up to)	Max # of display interfaces	Max # of external 4K displays	Multimedia HW Decode	Max DDR4 Rate MT/s (up to)	Ethernet Ports (Gb)	Max # of PCIe Lanes
R2544**	45W (35-54W)	4 / 8	3.35	3.7	8	1.3	4	4 x 4K	Up to 1x 4K60	3,200	-	16L Gen 3
R2514**	15W (12-35W)	4 / 8	2.1	3.7	8	1.2	4	3 x 4K	Up to 1x 4K60	2,667	-	16L Gen 3
R2314	15W (12-35W)	4 / 4	2.1	3.5	6	1.2	4	3 x 4K	Up to 1x 4K60	2,667	-	16L Gen 3
R2312	15W (12-25W)	2 / 4	2.7	3.5	3	1.2	3	3 x 4K	Up to 1x 4K60	2,400	-	8L Gen 3

*Preliminary frequencies and feature set targets for pre-production models

**Pre-production OPNs

Additional Key Benefits

- AMD “Zen+” x86 cores with support for up to 4 Cores/8 Threads with a total of 2MB of L2 cache and 4MB of shared L3 cache
- Broad set of high-speed peripherals and interfaces with up to 16 lanes of PCIe® Gen3, 2x SATA 3.0, and 6 USB ports (USB 3.2 Gen2 and 2.0)
- OS support includes Microsoft Windows® 11 64-bit, and Linux® Ubuntu® LTS
- Enterprise class security features supported by the AMD Secure Processor to help protect sensitive data and validate code before it is executed and AMD Memory Guard for real-time DRAM memory encryption
- Planned product availability extends up to 10 years, providing customers with a long-lifecycle support roadmap

For more information about the specific features and specifications supported by select products in AMD's solutions portfolio, or to learn more about AMD's Ryzen™ Embedded R1000 Processor Family, visit www.amd.com/en/products/ryzen-embedded-R2000-series

AMD.com/embedded

1. EMB-180 - Ryzen™ Embedded R2000 SoC offers up to 16 lanes of PCIe Gen3. Ryzen™ Embedded R1000 SoC offers up to 8 lanes of PCIe Gen3.
2. EMB-178 - Ryzen™ Embedded R2000 SoC offers up to 4 CPU cores. Ryzen™ Embedded R1000 SoC offers up to 2 CPU cores.
3. GD-176 - Video codec acceleration (including at least the HEVC (H.265), H.264, VP9, and AV1 codecs) is subject to and not operable without inclusion/installation of compatible media players.
4. GD-150 - Max boost for AMD Ryzen and Athlon processors is the maximum frequency achievable by a single core on the processor running a bursty single-threaded workload. Max boost will vary based on several factors, including, but not limited to: thermal paste; system cooling; motherboard design and BIOS; the latest AMD chipset driver; and the latest OS updates.