

# AMD EPYC™ 9004 SERIES PROCESSORS

## TOGETHER WE ADVANCE DATA CENTER COMPUTING

### AT A GLANCE

We take the mystery out of CPU selection with AMD EPYC™ processors: Just choose the core count, frequency, and L3 cache size your workload requires. Memory capacity, security features, I/O bandwidth, and the rest are included at no extra cost. Fourth-generation AMD EPYC processors build upon our innovative hybrid multi-chip architecture to deliver on the defining metric of our day: the ultimate combination of performance and efficiency. Gain 2.1x the integer and 2.2x the floating-point top-of-stack performance compared to our previous generation processors. [SP5-001C](#), [SP5-002C](#)



#### PERFORMANCE LEADERSHIP

**What can you do with 96 cores per processor? Accelerate real workload performance.**

Advance your cloud and business application throughput with 3x the integer performance and speed your technical applications with 2.5x the floating-point performance—comparing servers with 2x 96-core AMD EPYC 9654 processors with 2x 40-core Intel® Xeon® 8380 CPUs. [SP5-010B](#), [SP5-009C](#)



#### EFFICIENCY LEADERSHIP

**Help reduce CO<sub>2</sub> emissions—with energy-efficient AMD EPYC processor-powered servers.**

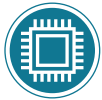
Moving just a few servers to AMD EPYC CPUs can help reduce CO<sub>2</sub> emissions while meeting performance needs. For example, to deliver 10,000 units of integer performance, you can deploy 17x 2P Xeon 8380-based servers, or just six 2P EPYC 9754 processor-powered servers. [SP5-041A](#) Imagine what moving a data center to EPYC powered servers could do for the planet—and for your overall costs.



#### ARCHITECTURE LEADERSHIP

**AMD Infinity Architecture is designed to propel future innovation.**

Our hybrid, multi-die architecture sets the stage for innovations today and in the future. Decoupling CPU cores from I/O frees us to take advantage of the best process technology available for each. Today we deliver up to 12 eight-core dies per processor for up to 96 cores. Our all-in system-on-chip (SoC) design integrates DDR5 memory controllers, SATA drivers, PCIe® Gen 5 I/O, CXL™ 1.1+ memory expansion, and an on-chip security processor. AMD Infinity Fabric™ connections between processors soar to 2x the speed of the prior generation.



#### 'ZEN 4': FIRST 5NM X86 SERVER PROCESSOR CORE

**Gain ~14% more instructions per clock over our prior generation.** [EPYC-038](#)

Generation over generation, we continuously improve our core designs. The new 'Zen 4' core combines performance and efficiency to give you an estimated 45% more integer and 73% more floating-point performance per core. [SP5-053](#), [SP5-052](#) Full support for AVX-512 includes BFLOAT16 and VNNI instructions to help speed artificial intelligence and machine learning applications.



#### LEADING MEMORY BANDWIDTH

**That's 50% more memory channels than any other x86-architecture CPU.** [EPYC-033](#)

The AMD EPYC 9004 Series supports 12 DDR5-4800 memory channels for the most available maximum memory bandwidth of any x86 processor. [EPYC-032](#) Interleaving over 2, 4, 6, 8, 10, or 12 paths help increase memory configuration flexibility.



#### I/O CAPACITY FOR DATA-HUNGRY APPLICATIONS

**Astonishing CPU performance needs I/O to match—we deliver 4x more than Intel Xeon 'Ice Lake.'** [EPYC-036](#)

Take an upgrade when you choose 4th Gen AMD EPYC processors: up to 160 lanes of PCIe Gen5 connectivity in a 2-socket server. Our future-ready system-on-chip design lets you customize with on-chip controllers for up to 64 lanes of CXL connectivity for cache-coherent memory pools, and up to 32 lanes of SATA interfaces to access massive amounts of local disk. All without any extra chipsets and external controllers that that can eat power and increase complexity. And in a 2-socket server you can get 12 PCIe Gen3 bonus lanes for bandwidth-insensitive I/O.



#### SECURITY THAT IS "HARDENED AT THE CORE"

**Our AMD Infinity Guard features<sup>1</sup> help protect your most valuable asset—your data.**

Enhanced L2 cache management helps repel side-channel attacks and encrypted persistent memory helps protect your critical data.

# AMD EPYC™ 9004 SERIES PROCESSORS

MODEL	CORES	THREADS	BASE FREQ. (GHZ)	UP TO MAX BOOST FREQ. (GHZ) <sup>a</sup>	ALL-CORE BOOST (GHZ) <sup>b</sup>	DEFAULT TDP (W)	L3 CACHE (MB)	DDR5 CHANNELS	UP TO MAX DDR5 FREQ. (1DPC)	PER-SOCKET THEORETICAL MEMORY BANDWIDTH (GB/S)	PCIe® GEN 5 LANES	2P/1P
9654	96	192	2.40	3.70	3.55	360	384	12	4800	460.8	128	2P/1P
9654P												1P
9634	84	168	2.25	3.70	3.10	290	384	12	4800	460.8	128	2P/1P
9554	64	128	3.10	3.75	3.75	360	256	12	4800	460.8	128	2P/1P
9554P												1P
9534	64	128	2.45	3.70	3.55	280	256	12	4800	460.8	128	2P/1P
9454	48	64	2.75	3.80	3.65	290	256	12	4800	460.8	128	2P/1P
9454P												1P
9354	32	64	3.25	3.80	3.75	280	256	12	4800	460.8	128	2P/1P
9354P												1P
9334	32	56	2.70	3.90	3.85	210	128	12	4800	460.8	128	2P/1P
9254	24	48	2.90	4.15	3.90	200	128	12	4800	460.8	128	2P/1P
9224	24	48	2.50	3.70	3.65	200	64	12	4800	460.8	128	2P/1P
9124	16	32	3.00	3.70	3.60	200	64	12	4800	460.8	128	2P/1P
HIGH-FREQUENCY AMD EPYC 9004 SERIES PROCESSORS												
9474F	48	96	3.60	4.10	3.95	360	256	12	4800	460.8	128	2P/1P
9374F	32	64	3.85	4.30	4.10	320	256	12	4800	460.8	128	2P/1P
9274F	24	48	4.05	4.30	4.10	320	256	12	4800	460.8	128	2P/1P
9174F	16	32	4.10	4.40	4.15	320	256	12	4800	460.8	128	2P/1P

a. Maximum boost for AMD EPYC processors is the maximum frequency achievable by any single core on the processor under normal operating conditions for server systems. EPYC-18.  
 b. All-core boost for AMD EPYC processors is the average frequency of all processor cores running in performance mode while utilizing a low activity workload. Actual achievable all-core boost will vary based on hardware, software, workloads and other conditions. (EPYC-021)

## FOOTNOTES

For details on the footnotes used in this document, click on the links or visit [amd.com/en/claims/epyc4](https://www.amd.com/en/claims/epyc4)

1. AMD Infinity Guard features vary by EPYC processor generations. Infinity Guard features must be enabled by server OEMs and/or Cloud Service Providers to operate. Check with your OEM or provider to confirm support of these features. Learn more about Infinity Guard at <https://www.amd.com/en/technologies/infinity-guard>. GD-183

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