



NEWS RELEASE

Ambiq Reveals 12nm SPOT® Platform Enabling Operation Down to 300mV for Atomiq™

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AUSTIN, Texas--(BUSINESS WIRE)-- Ambiq Micro, Inc. ("Ambiq®"), a leader in ultra-low-power semiconductor solutions for edge AI, today revealed new technical details of its upcoming Atomiq™ SoC. Built on Ambiq's newly designed 12nm SPOT® platform using the TSMC N12e® process, Atomiq introduces a new Ultra-Low-Power (ULP) mode engineered to operate as low as 300mV— the lowest operating voltage in Ambiq's history.

This announcement marks the first planned deployment of SPOT on a FinFET node and reflects continued progress toward initial Atomiq110 samples, with production scheduled for 2027.

FinFET + SPOT: Unlocking a New Power Frontier

By combining Ambiq's proprietary subthreshold design methodology with TSMC's advanced 12nm FinFET process, Atomiq enables high-speed sub- and near-threshold performance that was previously impractical in planar CMOS processes.

The new ULP mode targets operation at voltages as low as 300mV while maintaining effective performance, expanding dynamic range across Ultra-Low-Power (ULP), Low-Power (LP), and High-Performance (HP) modes. This advancement positions Ambiq to deliver its lowest operating voltage and highest energy efficiency to date.

Purpose-Built for Edge AI

Atomiq is optimized for AI workloads, which scale efficiently through parallel processing rather than raw clock speed. The previously announced Arm® Ethos™-U85 NPU executes hundreds of multiply-accumulate (MAC)

operations simultaneously, delivering tens of billions of operations per second even in ULP mode with clock speeds as low as 100 MHz.

Running inference in ULP mode near 300mV is expected to significantly reduce energy consumption for edge AI applications while using standard development tools and ecosystems. This ultra-low-power feature supports the SoC's subsystems, including the processor, NPU, and multimedia engines.

Platform Innovation Enabling Ultra-Low-Power Operation

Achieving operation down to 300 mV required significant architectural innovation. Atomiq incorporates a redesigned on-chip power management unit with a highly configurable, multi-channel Single-Inductor Multiple-Output (SIMO) buck converter. This adaptive power system dynamically adjusts to variations in process, temperature, and workload, delivering six independent voltage rails across load ranges spanning from nanoamps to milliamps.

Achieving such aggressive voltage scaling also required development of new custom foundation IP engineered for reliable ultra-low-voltage operation. The 12nm SPOT platform has been validated on silicon in Ambiq's labs, marking a significant technical milestone toward commercializing Atomiq.

Executive Quotes

"Atomiq represents years of SPOT refinement and architectural innovation," said Scott Hanson, Founder and CTO of Ambiq. "Bringing SPOT to a 12nm FinFET node allows us to push voltage lower than ever before while delivering the performance required for next-generation edge AI."

"As IoT devices evolve to meet the demands of the AI era, they require cutting-edge semiconductor technologies to achieve faster performance, optimized power efficiency, and minimized power leakage," said Dr. Lucas Tsai, Vice President of Business Management at TSMC North America. "We continue to collaborate with industry innovators like Ambiq to drive advancements in ultra-low-power semiconductor solutions through our industry-leading ULP IoT platform."

Looking Ahead

The Atomiq110 SoC is scheduled for production in 2027. Ambiq also plans to announce additional innovations in the coming months to address one of the remaining power challenges in AI systems: memory efficiency.

Visit Ambiq at **Embedded World 2026 in Hall 4, Booth 581** to learn more about Atomiq. For additional details and

to subscribe to the latest Atomiq news alerts, visit **Atomiq's product page**.

About Ambiq

Headquartered in Austin, Texas, Ambiq's mission is to enable intelligence (artificial intelligence (AI) and beyond) everywhere by delivering the lowest power semiconductor solutions. Ambiq enables its customers to deliver AI compute at the edge, where power consumption challenges are the most severe. Ambiq's technology innovations, built on the patented and proprietary subthreshold power optimized technology (SPOT®), fundamentally deliver a multi-fold improvement in power consumption over traditional semiconductor designs. Ambiq has powered over 290 million devices to date. For more information, visit **www.ambiq.com**.

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