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Edge AI Chips: Technologies, Markets, and Forecasts 2026–2036

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Abstracts

The global market for edge AI chips is entering a period of unprecedented growth as artificial intelligence transitions from centralised cloud data centers to the devices where data is generated — smartphones, vehicles, robots, industrial sensors, and personal computers. Edge AI chips, encompassing Neural Processing Units (NPUs), Graphics Processing Units (GPUs), and Central Processing Units (CPUs) optimised for machine learning inference, enable devices to make intelligent decisions locally, without reliance on cloud connectivity. This eliminates latency, enhances data privacy, reduces bandwidth requirements, and enables real-time autonomous operation in safety-critical applications. The edge AI chip market is forecast to exceed US$80 billion by 2036, driven by five key application segments: automotive, AI smartphones, AI PCs, humanoid robots, and AI sensors for predictive maintenance.

This report provides a comprehensive analysis of the edge AI chip market, covering technology architectures, application markets, competitive dynamics, geographic forecasts, and 54 detailed company profiles spanning established semiconductor giants, AI-focused startups, and cloud provider edge solutions. Market forecasts are provided from 2026 to 2036, segmented by geographic region (United States, China, Europe, and Rest of World) and by application. The report delivers actionable intelligence for semiconductor companies, chip designers, OEMs, system integrators, investors, and policymakers navigating this rapidly evolving market.

The automotive sector represents one of the highest-growth opportunities, with the transition from SAE Level 2+ to Level 3 autonomous driving shifting legal responsibility from the driver to the OEM, necessitating substantially greater edge AI compute. Intelligent cockpit systems represent an additional automotive sub-market requiring dedicated AI processing for voice assistants, driver monitoring, gesture recognition, and

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augmented reality displays. Together, autonomous driving and intelligent cockpit functions make automotive one of the two largest edge AI chip markets alongside consumer electronics.

AI smartphones dominate the edge AI chip market by volume, with every major OEM now offering AI-enabled features on flagship devices as of January 2026. The report benchmarks flagship AI processors from Apple, Qualcomm, MediaTek, Samsung, Google, and Huawei, and analyses the premiumization trend that is driving mid-range phones to eat into budget phone market share. AI PCs, defined as those exceeding 40 TOPS of dedicated AI processing, represented less than 10% of new PC sales in 2025 but are expected to constitute the majority of new sales by the early 2030s, with platforms from Intel, Qualcomm, Apple, and AMD competing for market share.

Humanoid robots are identified as a nascent but high-potential application segment. As of 2026, deployments are scaling on automotive manufacturing floors, with expansion into patrolling, surveillance, and household environments expected over the next decade. The required AI compute per robot is forecast to increase significantly as tasks grow in complexity beyond current picking and logistics operations.

The report examines the edge AI chip supply chain across CPU, NPU, and GPU architectures, including a detailed review of cutting-edge semiconductor manufacturing processes at 3nm, 2nm, and beyond, covering TSMC, Samsung Foundry, and Intel. Advanced packaging technologies including chiplets, 2.5D/3D integration, and fan-out wafer-level packaging are analysed for their impact on edge AI processor capability and cost. The geopolitical dimension is covered extensively, including the impact of US export controls on the China market, domestic Chinese semiconductor self-sufficiency efforts, and government investment programmes including the CHIPS and Science Act, the European Chips Act, and equivalent programmes in Japan and South Korea.

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Companies Profiled include Advanced Micro Devices (AMD), Alpha ICs, Amazon Web

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Services (AWS), Ambarella, Anaflash, Apple, Axelera AI, Axera Semiconductor, Blaize, BrainChip Holdings, Cerebras Systems, Corerain Technologies, DEEPX, DeGirum, EdgeCortix, Efinix, EnCharge AI, ENERZAi, Google, Graphcore, GreenWaves Technologies, Gwanak Analog, Hailo, Huawei, Innatera Nanosystems and more...

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