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US Application-Specific Integrated Circuits (ASIC) Market - Strategic Insights and Forecasts (2026-2031)

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Abstracts

The US Application-Specific Integrated Circuits (ASIC) market is forecast to grow at a CAGR of 2.6%, reaching USD 10.1 billion in 2031 from USD 8.9 billion in 2026.

The US Application-Specific Integrated Circuits (ASIC) market is witnessing rapid growth driven by the proliferation of artificial intelligence (AI), generative AI (Gen AI), and high-performance computing requirements. These trends are pushing hyperscale cloud providers, AI developers, and industrial end-users to adopt custom ASICs over commercial off-the-shelf processors due to their superior power efficiency, performance density, and workload optimization.

Government initiatives, particularly the CHIPS and Science Act of 2022, have further accelerated domestic ASIC development. By providing over $52 billion in subsidies and tax incentives, the act supports the construction of fabrication plants (fabs), increases domestic production capacity, and mitigates geopolitical risks stemming from reliance on East Asian wafer fabrication. The Data Centers & Cloud Computing sector is the most significant driver, with hyperscale operators seeking full-custom ASIC solutions for AI accelerators, high-speed SerDes, and advanced packaging technologies.

Market Drivers

The primary market driver is the escalating demand for accelerated computing platforms. Large-scale AI and machine learning models require application-specific silicon for lower latency, higher throughput, and energy efficiency. ASICs tailored to specific workloads outperform general-purpose CPUs and GPUs, stimulating demand for full-custom, standard-cell, and semi-custom ASICs.

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Geopolitical considerations and supply chain vulnerabilities further support domestic ASIC development. The concentration of advanced wafer fabrication in Taiwan and other Indo-Pacific regions exposes US firms to supply disruptions. Domestic production of ASICs strengthens national security, reduces risk, and provides strategic advantages in defense, industrial, and high-performance computing applications.

The growing adoption of AI and high-performance workloads across data centers, automotive, industrial IoT, and healthcare applications also drives market growth. Semi-custom and programmable ASICs present opportunities for mid-tier users who require performance optimization without the full-custom ASIC's high non-recurring engineering (NRE) costs.

Market Restraints

High capital expenditure is a key challenge. Advanced node fabs, particularly at 3nm and below, require investments exceeding $20 billion. These costs limit entry for new manufacturers and concentrate production among a few global foundries. Additionally, ASIC design complexity increases NRE costs, limiting adoption among smaller end-users. Environmental regulations, including RoHS, also incentivize greener and more sustainable ASIC designs, which may impose additional compliance costs.

Technology and Segment Insights

By process technology, the market spans mature nodes (22nm+), mid-range nodes (10–16nm), leading-edge nodes (5–7nm), and advanced nodes (3nm and below). The 3nm and below segment is primarily driven by AI accelerators and data center workloads requiring maximum transistor density and minimal power consumption.

By product type, ASICs include full-custom, semi-custom, standard-cell-based, gate-array-based, and programmable ASICs. Full-custom designs dominate data center and AI applications, while semi-custom and programmable solutions provide cost-effective alternatives for industrial, IoT, and healthcare end-users.

Data Centers & Cloud Computing remain the primary application segment due to the enormous demand for AI infrastructure. Automotive, industrial & IoT, networking, healthcare, defense, and consumer electronics constitute secondary segments.

Competitive and Strategic Outlook

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The US ASIC market features a mix of large integrated device manufacturers (IDMs) and nimble fabless design firms. Marvell focuses on accelerated infrastructure silicon and advanced 2nm platform development for hyperscale cloud providers. Onsemi targets power-efficient ASICs for automotive, industrial, and IoT applications, leveraging IP acquisitions to strengthen its power management portfolio. Competition centers on speed-to-market, advanced node design, and specialization in high-performance workloads.

The US ASIC market is poised for robust growth through 2031, driven by AI, cloud computing, and advanced node demand. Government incentives, high-performance data center requirements, and domestic production initiatives will continue to strengthen the market. The combination of technological advancement, strategic policy support, and strong end-user adoption ensures sustained expansion across both commercial and industrial sectors.

Key Benefits of this Report

Insightful Analysis: Gain detailed market insights across regions, customer segments, policies, socio-economic factors, consumer preferences, and industry verticals.

Competitive Landscape: Understand strategic moves by key players to identify optimal market entry approaches.

Market Drivers and Future Trends: Assess major growth forces and emerging developments shaping the market.

Actionable Recommendations: Support strategic decisions to unlock new revenue streams.

Caters to a Wide Audience: Suitable for startups, research institutions, consultants, SMEs, and large enterprises.

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Industry and market insights, opportunity assessment, product demand forecasting, market entry strategy, geographical expansion, capital investment decisions, regulatory

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analysis, new product development, and competitive intelligence.

Report Coverage

Historical Data: 2021-2024, Base Year: 2025, Forecast Years: 2026-2031

Growth opportunities, challenges, supply chain outlook, regulatory framework, and trend analysis

Competitive positioning, strategies, and market share evaluation

Revenue growth and forecast assessment across segments and regions

Company profiling including strategies, products, financials, and key developments

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10. APPENDIX

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