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

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## Abstracts

The China Application-Specific Integrated Circuits (ASIC) Market is expected to grow from USD 6.0 billion in 2026 to USD 8.4 billion in 2031, at a 7.0% CAGR.

The Chinese ASIC market operates within an intricate environment defined by strategic governmental direction and acute geopolitical pressure. China's long-standing dependence on foreign suppliers for advanced processors has created a recognized national security vulnerability, prompting substantial state-backed capital inflows through vehicles such as the National Integrated Circuit Industry Investment Fund to establish robust, self-reliant semiconductor supply chains. The market is defined by a dual dynamic: on one side, massive domestic demand from AI, 5G networking, intelligent vehicles, and hyperscale data centers drives unprecedented custom silicon consumption; on the other, intensifying export controls on advanced semiconductor manufacturing equipment and Electronic Design Automation software from Western jurisdictions constrain access to leading-edge fabrication nodes, redirecting domestic players toward mature and mid-range node innovation as a strategic adaptation. This tension shapes both the volume and the technology profile of ASIC demand across the forecast period.

Market Drivers

The 'Made in China 2025' national strategy is the foundational demand catalyst, setting explicit self-sufficiency targets in high-technology sectors including integrated circuits and compelling major state-owned enterprises and local manufacturers to replace imported components with domestically designed ASICs. This policy mandate broadens the customer base for indigenous chip producers across industries and directs government procurement toward locally sourced silicon, creating captive demand that

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underpins the market's baseline growth trajectory. The aggressive push for electric and intelligent vehicles simultaneously creates one of the highest-value demand concentrations in the market, as some EVs incorporate over three times the semiconductor content of conventional vehicles. Domestic automakers are increasingly co-developing chips with local ASIC design firms to optimize performance for China's road and regulatory conditions, focusing demand on battery management systems, high-voltage power electronics, and centralized domain controller ASICs.

The 5G rollout and expansion of hyperscale data centers create a third major demand vector for customized networking and computing ASICs optimized for high-throughput, low-latency applications. Major domestic internet and cloud service providers are driving in-house development of custom AI accelerator ASICs to improve performance-per-watt ratios in their server farms, with these chips tailored for specific neural network architectures and high-bandwidth memory interfaces. In April 2025, Huawei announced development of its Ascend 910D AI chip, an advanced ASIC designed to compete with high-end international GPUs, illustrating the market's accelerating push for domestic AI infrastructure self-sufficiency.

Market Restraints

Constricted access to advanced process technologies is the primary structural constraint. US Bureau of Industry and Security export controls restricting the transfer of advanced semiconductor manufacturing equipment and EDA software for sub-14nm nodes to select Chinese entities directly limit the ability of domestic foundries to achieve parity with global leaders in 5nm and 3nm fabrication. This restriction poses a significant challenge to high-end ASIC demand for cutting-edge AI acceleration and data center applications, where performance-per-watt at leading-edge nodes is a non-negotiable technical requirement. China's domestic ASIC design houses remain substantially reliant on third-party EDA tools subject to foreign export licensing, introducing supply certainty risk at the critical design phase of the value chain.

The domestic foundry ecosystem, while rapidly expanding through SMIC and Hua Hong Semiconductor, remains concentrated in mid-range and mature nodes, lagging global leaders in advanced fabrication capability. This capacity gap creates ongoing dependency on foreign foundry services for the most performance-critical ASIC designs. Volatility in commodity prices for ultrapure silicon wafers, rare earth metals used in sputtering targets, and specialty gases required for etching and deposition processes introduces additional manufacturing cost uncertainty, particularly given China's intensive domestic production volumes.

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## Technology and Segment Insights

By process technology, export control constraints are redirecting a meaningful portion of domestic ASIC innovation toward mature nodes of 22nm and above and mid-range nodes from 10nm to 16nm, where ASICs still deliver substantial performance and cost advantages over general-purpose chips for a wide range of industrial, automotive, and consumer applications. SMIC's 28nm node serves as a critical domestic platform for high-volume automotive and consumer electronics ASIC production, and its N+1 process delivering 7nm-class performance represents the frontier of domestically achievable advanced node fabrication. Advanced and leading-edge node demand persists for AI acceleration and cloud infrastructure, though increasingly served by domestically developed architectures operating within available process constraints rather than relying on offshore leading-edge foundries.

The Data Centers and Cloud Computing segment is the highest-urgency demand concentration, with custom AI accelerator ASICs becoming an economic and technological imperative for major domestic cloud providers seeking energy efficiency at massive scale. The Automotive segment functions as the largest volume-driven demand anchor, with the industry's shift from distributed ECU architectures to centralized domain controllers requiring powerful, custom-designed ASICs for ADAS sensor fusion, battery management, and high-voltage power electronics. By product type, Full-Custom ASICs command the highest value in defense, AI acceleration, and secure transaction applications, while Semi-Custom standard cell-based designs serve high-volume networking, telecommunications, and automotive control unit requirements.

## Competitive and Strategic Outlook

The competitive landscape is intensely polarized between established global IDMs and fabless giants that historically dominated high-end segments and a rapidly emerging, state-supported domestic ecosystem capturing market share in mid-range and mature nodes. SMIC anchors the domestic supply chain as China's largest and most advanced pure-play foundry, serving as the primary manufacturing partner for local fabless ASIC design houses and prioritizing its 28nm and N+1 processes as platforms for import substitution across automotive and consumer electronics. Fudan Microelectronics Group occupies a strategically important domestic niche in secure chips, smart meter ASICs, and FPGAs, with its product focus on government-mandated infrastructure including social security cards and financial transaction systems directly addressing the national imperative for trusted indigenous silicon in sensitive applications.

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NVIDIA maintains significant market presence through AI and data center solutions that define the top-tier performance benchmark for domestic ASIC challengers, creating competitive pressure for local firms to rapidly innovate in AI acceleration architectures. Intel, AMD, Onsemi, and NXP Semiconductors complete the international competitive field, while the domestic ecosystem of design houses continues expanding under National Big Fund capital injections and DLI-equivalent policy incentives. In April 2025, Hwatsing completed full acquisition of Xinyu Semiconductor, deepening its equipment-plus-services model for chemical mechanical polishing and signaling continued consolidation among domestic semiconductor equipment providers supporting the ASIC manufacturing base.

Key Takeaways

The China ASIC market is positioned for steady growth through 2031, driven by a convergence of national self-sufficiency mandates, AI and cloud infrastructure expansion, automotive electrification, and 5G densification that collectively sustain high and diversified custom silicon demand. Advanced node access constraints, EDA software dependency, and the competitive performance gap at leading-edge fabrication represent persistent structural headwinds, but the domestic innovation response across mature and mid-range nodes, progressive Big Fund capital deployment, and accelerating in-house chip development by major domestic technology companies collectively underpin a resilient and strategically anchored ASIC market trajectory across the forecast period.

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Key Benefits of this Report

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Historical data from 2021 to 2025 and forecast data from 2026 to 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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