Custom SoC (ASIC) Market - Global Outlook & Forecast 2025-2030

Market Report | 2025-04-16 | 266 pages | Arizton Advisory & Intelligence

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Report description:

The global custom SoC (ASIC) market is expected to grow at a CAGR of 5.25% from 2024 to 2030.

CUSTOM SoC (ASIC) MARKET KEY HIGHLIGHTS

-The rising adoption of IoT devices is significantly increasing the need for custom SoCs. Manufacturers are focusing on creating highly integrated solutions that efficiently manage connectivity, processing, and data analytics, enabling smarter homes, industrial automation, and advanced smart city infrastructures.
-The rapid expansion of AI & ML is driving the demand for specialized chips. Custom SoCs are essential for handling complex computations and optimizing performance for AI algorithms, with companies like Broadcom and Qualcomm leading the market with their customized processors designed specifically for these capabilities.
-The evolution of the automotive industry toward electric and autonomous vehicles is propelling the development of custom application-specific integrated circuits (ASICs) and supports the global custom SoC (ASIC) market growth. These specialized chips are critical for managing advanced driver-assistance systems (ADAS), electric powertrains, vehicle-to-everything (V2X) communication, enhanced safety, and advanced features.
-Ongoing innovations in semiconductor production, such as the development of 3nm and 5nm process nodes, are improving design capabilities for custom SoCs. These advancements allow manufacturers to create smaller, more powerful, and energy-efficient chips, opening new possibilities for complex applications across various industries.

CUSTOM SoC (ASIC) MARKET TRENDS & DRIVERS

Emerging Demand for Consumer Electronics

Consumer electronics is estimated to witness a significant demand for custom SoCs based on their application. This is largely attributed to the increasing adoption of smartphones due to the growing disposable incomes of consumers. As per Ericsson, the worldwide tally of smartphone mobile network subscriptions came close to 6.4 billion in 2022 and is estimated to exceed 7.7

billion by 2028. Moreover, increasing investments in the consumer electronics industry across various countries are expected to enhance market opportunities significantly. For instance, in 2023 Indian government actively encouraged investments to establish electronics manufacturing facilities. Initiatives like the Production Linked Incentive (PLI) scheme aim to boost local production capabilities. Thus, mobile manufacturers such as Samsung and Apple have increased their manufacturing operations in developing countries to cater the market growth. Thus, such growth in the consumer electronic sector is substantially supporting the custom SoC (ASIC) market growth.

Impact of Generative AI

Generative AI is poised to revolutionize the custom SoC (ASIC) markets by significantly enhancing efficiency, reducing design complexity, and enabling greater innovation. Custom SoCs, critical in domains such as telecommunications, automotive, healthcare, and IoT, require intricate design processes that traditionally consume vast amounts of time and resources. Generative AI, with its capacity to automate and optimize design workflows, is emerging as a game-changer in this field. Moreover, generative AI transforms the custom SoC (ASIC) market through design automation and optimization. Traditionally, SoC and ASIC designs are created by expert engineers who manually map out circuit layouts, often relying on extensive trial-and-error methods to achieve optimal results. Generative AI models, like reinforcement learning algorithms, can streamline this process by rapidly iterating through design variations to identify optimal configurations for power efficiency, performance, and area (PPA). For instance, Google's DeepMind has collaborated with hardware teams to use AI for chip floor planning. Their generative AI system reduces the time taken to achieve chip floorplans from weeks to hours while often producing layouts that outperform those designed by human engineers.

INDUSTRY RESTRAINTS

High Design & Manufacturing Cost

Custom SoC (ASIC) design requires a significant initial investment, for R&D, and specialized tools for designing chips ranging from around USD 30 million to USD 100 million. The complexity of integrating diverse functionalities into a single chip can lead to extended development timelines, delaying time-to-market and increasing project risks. Additionally, the rapid pace of technological advancements poses a constant threat of obsolescence, as designs may become outdated before full deployment, requiring continuous innovation to remain competitive, thus hindering the custom SoC (ASIC) market growth.

CUSTOM SoC (ASIC) MARKET SEGMENTATION INSIGHTS

INSIGHTS BY DESIGN TYPE

The global custom SoC (ASIC) market by design type is segmented into semi-custom, fully custom, platform-based, and other designs. In 2023, the semi-custom design is dominating the market and growing at a CAGR of 7.75% during the forecast period. The growth is attributed to growing adoption in sectors like AI, cloud computing, and telecommunications drives the need for semi-custom chips that offer an optimal blend of customization, performance, and cost-effectiveness. Moreover, devices like smartphones, smart TVs, wearables, and gaming consoles often use semi-custom SoCs. For instance, Apple's A-series chips used in iPhones and iPads are based on semi-custom designs, integrating off-the-shelf ARM cores with custom elements tailored to Apple's ecosystem, such as their neural engine and specialized co-processors.
Furthermore, the platform-based segment is growing at a high CAGR in the global custom SoC (ASIC) market because it allows easy integration of new features or technologies, making them adaptable to evolving requirements. In regions like Europe, the demand for platform-based custom SoCs is growing primarily in the automotive, industrial, and IoT sectors. With an increasing push toward Industry 4.0, European countries are integrating more automation and AI technologies into their industrial sectors, requiring custom SoCs for tasks like machine vision, data processing, and edge computing.

Segmentation by Application
-Consumer Electronics
-Automotive
-Data Centers
-Telecommunications
-Industrial
-Healthcare
-Aerospace & Defense
-Other Users

INSIGHTS BY APPLICATION

The consumer electronics application segment holds the most significant share of the global custom SoC (ASIC) market. The higher market share is ascribed to the growing adoption of smartphones, wearables, smart TVs, and other connected devices has significantly boosted the demand for advanced chip designs for these applications. Moreover, countries like China, South Korea, and Taiwan, are witnessing significant growth in custom SoC demand due to the presence of key manufacturers like MediaTek, Samsung, and Socionext. The rise in 5G deployment, smart home devices, and the proliferation of wearables has increased the need for region-specific SoCs. MediaTek, for example, has strengthened its position in the consumer electronics market by providing SoCs for a range of devices, from smartphones to smart TVs and IoT applications. Furthermore, the automotive segment is growing at a high CAGR rate of 9.58% in the custom SoC (ASIC) market during the forecast period because of the rising shift towards EV and autonomous vehicles which largely use SoCs in IoT and connectivity features, such as infotainment systems and V2X communication, requiring custom chips for handling data processing and communication.

INSIGHTS BY END-USERS

The global custom SoC (ASIC) market by end-users is segmented into large enterprises, small & medium enterprises, and research institutes. In 2024, large enterprises accounted for the largest end-user segmental revenue share. Large enterprises are rapidly adopting these technologies to enhance operational efficiency, improve customer experience, and innovate their business models. Companies in this segment require specialized solutions to optimize performance, reduce power consumption, and lower operational costs in mission-critical operations. Furthermore, the small and medium enterprises segment is growing at a high CAGR of 9.04% in the custom SoC (ASIC) market during the forecast period as with more affordable solutions and scalable platforms, they are increasingly adopting custom and semi-custom semiconductor designs that allow them to improve efficiency, reduce costs, and remain competitive in their markets.

Segmentation by End-Users
-Large Enterprises
-Small & Medium Enterprises
-Research Institutes

CUSTOM SoC (ASIC) MARKET GEOGRAPHICAL ANALYSIS

The APAC region dominates the global custom SoC (ASIC) market, accounting for a revenue share of more than 41% and growing at a CAGR of 9.37% during the forecast period. The rising demand for advanced technologies in industries such as consumer electronics, automotive, and telecommunications, with established semiconductor manufacturing capabilities, drives this custom SoC (ASIC) solutions market growth in the region. Further, the smartphone penetration in countries like India supports the demand for custom SoC. For instance, as per a report by the Internet and Mobile Association of India (IAMAI), the number of smartphone

users in India is expected to exceed 1 billion by 2025. This surge in smartphone adoption is driving substantial growth in the digital industry.
Moreover, the custom SoC (ASIC) market is also growing significantly in regions like North America and Europe owing to the strong presence of semiconductor manufacturers and a robust R&D system. In North America, companies such as Qualcomm, NVIDIA, and Intel are major payers of custom SoC development, leveraging their advanced technological capabilities to produce highly specialized chips for various industries. Additionally, in Europe, the rising demand for EVs is also supporting the custom SoC (ASIC) market growth. For instance, according to the European Environment Agency, in 2023, around 91,000 electric vans were sold in the EU-27, representing 7.7% of the market share, marking an increase of approximately 2 percentage points from 2022. This surge in EV sales is driving the need for highly specialized custom SoCs to meet the specific requirements of these vehicles.

-North America
oThe U.S.
oCanada
-Europe
oGermany
oThe U.K.
oFrance
oItaly
oSpain
oSweden
-APAC
oChina
oJapan
oIndia
oAustralia
oSouth Korea
oThailand
-Latin America
oBrazil
oMexico
oArgentina
oChile
-Middle East & Africa
oUAE
oSouth Africa
oSaudi Arabia
oTurkey

CUSTOM SoC (ASIC) MARKET VENDORS INSIGHTS

The global custom SoC (ASIC) market is highly competitive, with key players ranging from large semiconductor companies to specialized design firms. Major players in the global custom SoC (ASIC) market include Qualcomm, Broadcom, Apple, Intel, Nvidia, TSMC, Broadcom, and Samsung, which are investing heavily in R&D to drive innovation in custom chip design. Collaboration, mergers, and acquisitions are a few general strategies in the custom SoC (ASIC) solutions market among leading firms to expand their market presence and penetrate emerging economies. For instance, in 2023, Apple and Broadcom entered into a strategic partnership aimed at advancing the development of custom SoC chips designed for AI integration. This collaboration focused on Broadcom's expertise in wireless technology and Apple's prowess in custom silicon design to create highly specialized chips that

enhance the performance of AI-driven applications across Apple's ecosystem.
Additionally, smaller firms like Sondrel, Mediatek, Greenwaves Technologies, and SiFive are also catering to the custom SoC (ASIC) market share by focusing on offering solutions for niche and emerging applications. These companies are increasingly differentiating themselves through specialized designs that address the unique needs of specific industries, leveraging agility and innovation to gain traction in high-growth sectors. For instance, in 2023, MediaTek's investment in AI-enhanced SoCs enabled the company to provide advanced, energy-efficient solutions for devices in sectors such as smart homes, wearables, and automotive. MediaTek's approach of offering versatile, customizable chip solutions for mid-range and budget devices has expanded its reach in developing economies.

Key Company Profiles

- Apple Inc.
- Qualcomm
- Socionext Inc.
- Broadcom

Other Prominent Vendors

- MediaTek
- Onsemi
- SiFive, Inc.
- Intel Corporation
- Arm Limited
- Advanced Micro Devices, Inc.
- Synaptics Incorporated
- Infineon Technologies AG
- Renesas Electronics Corporation
- Greenwaves Technologies
- InCore
- Sondrel
- SAMSUNG
- NVIDIA
- Taiwan Semiconductor Manufacturing Company Limited
- Marvell

KEY QUESTIONS ANSWERED:

1. How big is the global custom SoC (ASIC) market?
2. Which region dominates the global custom SoC (ASIC) market share?
3. Who are the key players in the global custom SoC (ASIC) market?
4. What are the significant trends in the custom SoC (ASIC) market?
5. What is the growth rate of the global custom SoC (ASIC) market?

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