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Application Specific Integrated Circuit Market Assessment, By Product [Programmable ASIC, Semi-custom ASIC, Full Custom ASIC], By Programming Technology [Static RAM, EPROM, EEPROM, Antifuse, Others], By End-user [Automotive, Consumer Electronics, Healthcare, Manufacturing, Others], By Region, Opportunities and Forecast, 2016-2030F

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Abstracts

Global application specific integrated circuit market size was valued at USD 15.7 billion in 2022, which is expected to reach USD 25.2 billion in 2030, with a CAGR of 6.1% for the forecasted period between 2023 and 2030.

Application specific integrated circuit (ASIC) offer significant benefits, such as reduced power consumption, and cost-effectiveness for specialized tasks. These custom-designed ICs cater to specific applications, optimizing efficiency and functionality. The growing demand for high-performance computing, artificial intelligence, and IoT devices drives the ASIC market. Moreover, ASICs enable faster time-to-market and lower development costs, making them attractive for industries like automotive, telecommunications, and consumer electronics, etc., propelling their continued growth.

ASICs are essential in IoT applications because they optimize power efficiency, processing, and connectivity, meet the specific requirements of diverse IoT devices and fuel market expansion. In February 2023, Exploding Topics stated that there are more than 15 billion interconnected IoT devices worldwide, and the figure is projected to be doubled by 2030. Moreover, Greater China is the largest contributor to the growth, with an impressive count of over 5 billion IoT devices. Moreover, North America and Europe contribute to more than 3 billion IoT devices.

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The Data Center Facilities are Fueling Market Growth

Data center facilities are acting as a significant driver for market growth. These facilities are designed to store and manage vast amounts of digital information, and computing resources are experiencing increased demand due to the expanding digital landscape. With businesses relying more on data-driven processes and cloud computing, data centers play a crucial role in sustaining their growth by providing the necessary infrastructure and capacity to support the ever-expanding digital ecosystem.

In July 2023, the Global Smart Green Data Center Summit was arranged in Ulanqab, Inner Mongolia, under the theme 'Smart DC, Building the Green Future.' Esteemed figures in the industry assembled to explore fresh prospects, requirements, and obstacles facing the data center sector in the AI computing era, with a special emphasis on eco-friendly data center methodologies. A noteworthy moment at the summit was the introduction of Huawei's trio of groundbreaking data center facility solutions.

Rapidly Increasing Adoption of Cryptocurrency Accelerates Growth

The exponential rise in cryptocurrency adoption is fueling the ASIC market growth extensively. Cryptocurrencies have gained widespread popularity, with more users participating in activities such as mining and trading. ASICs, specialized hardware designed for cryptocurrency mining, offer unparalleled efficiency and performance compared to generic alternatives. This rise in interest in cryptocurrencies has led to an escalating demand for ASICs, driving the market’s overall growth. Moreover, the market is responding with innovations and advancements in ASIC technology to cater to the expanding user base and meet their evolving needs, thus creating a symbiotic relationship between cryptocurrency adoption and the ASIC market acceleration. As per Triple-A, in 2023, the global cryptocurrency user base exceeded 420 million individuals, constituting an average ownership rate of 4.2%.

The Emergence of Smartwatches is Catering to Extensive Opportunities

The advent of smartwatches has created extensive opportunities for the ASIC market. These wearable devices demand specialized chips for various functions, including sensors, wireless connectivity, and power management. ASICs enable efficient design and customization, optimizing performance while conserving power. The growing popularity of smartwatches has spurred ASIC innovation, as manufacturers seek tailored solutions to meet the specific requirements of these devices, thereby driving the

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market growth.

For example, in September 2023, Apple unveiled the Apple Watch Series 9, enhancing the world's top-selling timepiece while marking an important environmental achievement. Series 9 boasts heightened potency courtesy of the S9 SiP, improving performance and capabilities. It has introduced a novel double-tap gesture, a brighter screen, expedited on-device Siri with health data access, precision finding for iPhones, and other enhancements.

Asia Pacific Dominate the Market

Asia Pacific dominated the ASIC market owing to robust semiconductor manufacturing infrastructure, with countries like China, Japan, Taiwan, and South Korea playing a major part in the market. Additionally, the demand for ASICs in emerging technologies like smartphones, IoT, and automotive applications has surged in Asia Pacific, driven by a large consumer base and increasing technological adoption. Furthermore, cost-effectiveness and skilled labor contribute to the region's ASIC market dominance.

In September 2023, China Integrated Circuit Industry announced that it aims to raise a substantial fund of USD 40 billion for its semiconductor sector. It has been marked as one of the biggest of the three fundings launched by the industry which is known as the Big Fund. Furthermore, its goal of achieving USD 41 billion (300 billion yuan) surpassed the amounts raised by its similar fundings in 2014 and 2019, which amounted to USD 18.95 billion (138.7 billion yuan) and USD 27.33 billion (200 billion yuan), respectively.

Government Initiatives

Government initiatives are crucial for the ASIC market's growth and competitiveness. These actions include investment in R&D, fostering semiconductor manufacturing infrastructure, and creating supportive policies. Moreover, these initiatives can promote innovation and incentivize local production, reducing dependency on foreign suppliers. Such initiatives enhance a country's technological capabilities, job creation, and economic growth, ensuring a strong and sustainable ASIC market while contributing to national security by reducing reliance on foreign sources for electronic components.

For example, A team of researchers from the National Institute of Standards and Technology (NIST) created an innovative tabletop apparatus capable of capturing three-dimensional X-ray (CT) images of integrated circuits. This prototype device delivers highly detailed scans, scrutinizing the numerous electrical components, some as tiny as

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160 nanometers (one-billionth of a meter) and densely packed on a microchip. Moreover, this tool offers novel means to detect defects and impurities while ensuring that a batch of microchips, regardless of their manufacturing origin.

Impact of COVID-19

The ASIC market experienced distinct phases before and during the COVID-19 pandemic. Pre-COVID-19, the ASIC market was steadily growing, driven by rising demand for specialized electronic components across various industries, including automotive, consumer electronics, and telecommunications. However, the pandemic disrupted global supply chains, leading to supply shortages and production delays. The initial uncertainty prompted a cautious approach among businesses, affecting ASIC sales. Post-COVID-19, the market has shown resilience, adapting to remote work, increased demand for IoT devices, and accelerated digital transformation. ASICs have played a crucial role in meeting these demands, particularly in 5G technology, artificial intelligence, and healthcare devices. As the world transitions to a more digitized and connected environment, the ASIC market is poised for continued growth, driven by ongoing technological advancements and evolving consumer needs.

Key Players Landscape and Outlook

The global application specific integrated circuit market is making significant progress, with prominent companies increasing their investments in smartwatches, smartphones, etc., to enhance their market presence and revenue. Additionally, firms are actively pursuing collaborations, acquisitions, and partnerships, reshaping the industry landscape and driving the overall market growth at an accelerated pace.

In September 2023, Intel announced its intention to create an ASIC accelerator to mitigate the substantial performance overhead, which is around a million-fold, linked to a software-only Fully Homomorphic Encryption (FHE) approach. Additionally, the company is set to release a beta version of an encrypted computing software toolkit. The toolkit will empower researchers, developers, and user communities to gain insights and experiment with FHE coding.

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