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2nm and Beyond Semiconductor Node Market Opportunity, Growth Drivers, Industry Trend Analysis, and Forecast 2025 - 2034

https://marketpublishers.com/r/2A439498E92AEN.html
Date: October 2025
Pages: 170
Price: US$ 4,850.00 (Single User License)
ID: 2A439498E92AEN

Abstracts

The Global 2nm And Beyond Semiconductor Node Market was valued at USD 19.1 billion in 2024 and is estimated to grow at a CAGR of 13.6% to reach USD 91.5 billion by 2034.

The market growth is driven by the rising demand for high-performance computing, expanding applications of artificial intelligence, the growth of 5G and edge computing, and increasing innovation in next-generation consumer electronics. Government-backed incentives and public investments are further accelerating market momentum. The semiconductor industry is undergoing a significant transformation fueled by the widespread integration of AI and machine learning, resulting in a heightened demand for ultra-efficient, high-performance logic chips manufactured using advanced 2nm and beyond nodes. As AI spending continues to rise sharply, this surge in innovation will reshape computing capabilities, creating new opportunities for performance-driven and energy-efficient chip technologies. Expanding 5G infrastructure and the growing adoption of edge computing are intensifying the need for smaller, faster, and more efficient chips, which is strengthening the adoption of 2nm technology across global industries.

The Intel Angstrom-level process segment is expected to grow at a CAGR of 20.6% between 2025 and 2034, supported by increasing requirements for advanced chip architectures in AI, 5G, autonomous systems, and high-performance computing applications. The ongoing focus on enhancing chip energy efficiency, miniaturization, and scalability is vital to maintaining the pace of technological progress. Continued investments in next-generation process technologies are crucial for supporting the demand for faster, smarter, and more power-efficient semiconductor solutions in

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emerging digital ecosystems.

The mobile processor segment accounted for USD 7.4 billion in 2024, making it the largest revenue-generating segment. Its growth is driven by surging demand for smartphones, wearables, and tablets, combined with technological advancements in AI-based computing and 5G network integration. The increasing performance expectations for portable devices are pushing manufacturers to design chips that balance energy efficiency with superior computing capabilities. Focus on miniaturization, multitasking, and low-power consumption will be key in addressing rising consumer demand for connected devices and supporting innovation in next-generation mobile technology.

United States 2nm and Beyond Semiconductor Node Market reached USD 2.2 billion in 2024. Growth in the U.S. market is being driven by strong government initiatives to enhance semiconductor manufacturing, support autonomous technology development, and expand high-performance data center infrastructure. Expanding AI research, growing cloud computing investments, and the rising importance of data-intensive applications are further strengthening market expansion. Manufacturers in the region are emphasizing innovation in process scalability, R&D collaboration, and energy-efficient chip production to meet increasing demand across industrial and commercial sectors.

Prominent companies active in the Global 2nm and Beyond Semiconductor Node Market include Intel Corporation, Taiwan Semiconductor Manufacturing Company, ASML Holding N.V., Samsung Electronics Co., Ltd., Tokyo Electron Limited, Lam Research Corporation, KLA Corporation, Applied Materials, Inc., Shin-Etsu Chemical Co., Ltd., Tokyo Ohka Kogyo Co., Ltd., FUJIFILM Electronic Materials, JSR Corporation, Rapidus Corporation, IMEC, and Tenstorrent Inc. Leading players in the 2nm and Beyond Semiconductor Node Market are employing a range of strategies to strengthen their competitive positioning. Companies are focusing on expanding production capacity, accelerating research in nanofabrication, and introducing innovative lithography technologies to improve performance and efficiency. Strategic alliances and collaborations between chip manufacturers, materials providers, and equipment suppliers are enhancing ecosystem integration and shortening development cycles. Heavy investments in AI-driven chip design and next-generation process nodes are enabling companies to achieve higher transistor density and performance per watt. Furthermore, firms are prioritizing sustainable manufacturing, process optimization, and advanced packaging techniques to maintain competitiveness and meet rising global demand for ultra-efficient semiconductors.

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