

GaN Semiconductor Devices Market to Hit USD 18.68 Billion by 2032 Driven by Demand for Energy-Efficient Technologies

The GaN Semiconductor Devices market is witnessing rapid expansion due to the growing need for energy-efficient and high-performance technologies.

AUSTIN, TX, UNITED STATES, January 23, 2025 /EINPresswire.com/ -- Market Size & Industry Insights

As Per the SNS Insider, "The [GaN Semiconductor Devices Market](#) size was USD 2.59 Billion in 2023 and is expected to reach USD 18.68 Billion by 2032, growing at a CAGR of 24.55% over the forecast period of 2024-2032."



GaN Semiconductor Devices Market Growth Driven by Energy-Efficient Solutions

The GaN Semiconductor Devices market is growing exponentially with the upsurge of demand for energy-efficient technologies in power electronics, electric vehicles (EVs), renewable energy, and consumer electronics. GaN devices are considered better for energy efficiency, switching speed, and size, which makes them more suitable for high-performance applications like EV battery chargers and DC/DC converters. Additionally, GaN is also highly relevant for the 5G power efficiency and the faster mobile charging solutions. Shifts in production toward ammonia-free and global clean energy drives are also enhancing market adoption, making GaN a crucial player in the pursuit of sustainable technological advancements.

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SWOT Analysis of Key Players as follows:

- Wolfspeed Inc.
- Sumitomo Electric Industries Ltd.

- MACOM Technology Solutions Holdings Inc.
- Mitsubishi Electric Corporation
- ROHM Co. Ltd.
- STMicroelectronics N.V.
- Innoscience Technology
- Fujitsu Ltd.
- NexGen Power Systems
- Odyssey Semiconductor Technologies Inc.
- Panasonic Corporation
- Osram Opto Semiconductors GmbH
- Aixtron SE
- Koninklijke Philips N.V.
- Taiwan Semiconductor Manufacturing Company (TSMC)
- Intel Corporation
- GLOBALFOUNDRIES
- Semiconductor Manufacturing International Corporation (SMIC)
- Skyworks Solutions Inc.
- Analog Devices Inc.

Segment Analysis

By Product

the Opto-GaN Semiconductor Devices segment dominates the GaN Semiconductor Devices market, holding around 45% of the market share in 2023. GaN is very well suited for optoelectronic applications due to its efficient emission of light across both visible and ultraviolet spectrums. GaN-based LEDs are widely used in energy-efficient lighting, displays, and automotive applications, offering superior brightness, color quality, and long lifespan compared to traditional LED technologies. In addition, GaN-based laser diodes are increasingly being used in optical communication systems, data storage, and advanced laser technologies due to their higher power output and energy efficiency.

By Component

The Power IC segment commands about 33% of the market share in 2023. GaN-based power ICs are increasingly important for managing power requirements in the automotive, telecommunication, and consumer electronics industries. GaN power ICs deliver a far better performance than conventional silicon-based ICs by showing higher efficiency, faster switching speed, and lower power dissipation. These devices are greatly valued in power supplies, inverters, motor drives, and DC/DC converters for their requirements in high-performance power conversion. GaN-based power ICs also allow for smaller, lighter designs and better thermal management, which further contributes to the miniaturization of electronic devices and drives their adoption in electric vehicles, renewable energy systems, and other applications

requiring compact and efficient solutions.

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KEY MARKET SEGMENTS:

By Product

- GaN Radio Frequency Devices
- Opto-semiconductors
- Power Semiconductors

By Component

- Power IC
- Transistor
- Rectifier
- Diode
- Others

By Wafer Size

- 2-inch
- 4-inch
- 6-inch
- 8-inch

By Application

- Signal
- Power
- Communications
- Consumer Electronics
- Automotive
- Military & Defense
- Medical
- Lighting and Lasers
- Supplies and Inverters
- Radio Frequency
- Other

Key Regional Developments

In 2023, North America held the largest share of around 36% in the GaN Semiconductor Devices market, largely driven by strong demand across industries like automotive, telecommunication, and consumer electronics. It has developed through advanced technological infrastructure, massive investment in R&D, and the presence of world-leading GaN Semiconductor Devices

manufacturers. The increased thrust on electric vehicles along with the growing importance of energy efficiency has seen increasing demand for GaN-based devices in power management systems, renewable energy applications, and power supplies.

Asia-Pacific is poised to become the fastest-growing region in the GaN Semiconductor Devices market over the forecast period from 2024 to 2032. Rapid industrialization and technological advances as well as surging energy-efficient demand from such countries as China, Japan, South Korea, and Taiwan propel the growth of GaN in these regions. These regions also represent major manufacturing GaN Semiconductor Devices hubs wherein many leading companies take up the applications of GaN technology for such applications as electric vehicles, telecommunications, consumer electronics, and renewable energy.

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Recent Developments

-In March 2024, EPC introduced the EPC2361, a 100V GaN FET with ultra-low 1m Ω on-resistance, offering double the power density compared to previous models. The EPC2361 improves power conversion efficiency and reduces energy consumption and heat dissipation, making it ideal for high-power applications such as AC-DC synchronous rectification and eMobility. The price of the EPC2361 is \$4.60 each in 3 Ku volumes.

-In January 2024, Transphorm launched two new SuperGaN[®] FETs, the TP65H035G4YS and TP65H050G4YS, available in a 4-lead TO-247 package. These FETs provide on-resistances of 35m Ω and 50m Ω , respectively, and offer versatility for high-power applications in data centers, renewable energy, and industrial power conversion. They reduce losses by up to 27% compared to SiC MOSFETs.

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