GaN RF Semiconductor Devices - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2025 - 2030)

Market Report | 2025-04-28 | 120 pages | Mordor Intelligence

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Report description:

The GaN RF Semiconductor Devices Market is expected to register a CAGR of 30.58% during the forecast period.

Key Highlights
- The successful implementation of IoT needs data transfer over a network without human-to-computer interaction. The increasing implementation of IoT will result in signal congestion and will demand the use of GaN technology that can amplify power, capacity, and the bandwidth required for communicating with all interconnected devices.
- Development of MEMS technology are an integral part of IoT devices, and will also have a positive impact on the GaN RF semiconductor devices market.Increasing demand for smartphones, gaming devices, laptops, and TVs is expected to drive the GaN semiconductor devices market in the consumer electronics sector.
- The increasing competition with SiC can hamper the market share of GaN RF Semiconductors as SiC has higher thermal conductivity than GaN meaning that SiC devices can theoretically operate at higher power densities than GaN.
- The ongoing crisis due to COVID-19 can act as a driver of technological advancement, despite the challenges faced by the industry. Whereas, in some cases, 5G is already proving its worth. For instance, in Wuhan (China), Huawei installed a 5G network in a specialist hospital in three days. As a result of the effort, 5G-enabled robots were able to help take care of patients in the hospital and take measurements, reducing the amount of time medical staff needs to spend with infectious patients.

GaN RF Semiconductor Devices Market Trends

Proliferation of Long Term Evolution Wireless Networks to Drive the Market Growth

- Rise in Long Term Evolution (LTE) wireless networks is one of the primary growth factors for the GaN RF semiconductor devices market. The constantly increasing data consumption has resulted in the growth of commercial networks and will induce network carriers to adopt next-generation LTE networks, such as 4G and 5G.
- Due to its ability to provide higher frequency data bandwidth connections, GaN RF technology will soon be the ideal choice for network service providers. GaN RF devices help in ensuring that the device can generate maximum frequency at the necessary band, and also prevent any interference from other frequency bands.
- The deployment of GaN RF power devices will allow LTE devices to offer speeds that allow consumers to upload and download content, such as music and photographs, and also play online games and watch online TV shows on maximum frequency bands, which will lead to a rise in their adoption.
- RF GaN plays a vital role in wireless infrastructure to improve efficiency and widen bandwidth to support the ever-increasing data transmission rate. Increasing adoption of 5G technology and advancements in wireless communication are set to be significant drivers for the RF GaN market. The increasing adoption of GaN power transistors could prove to be useful for telecom vendors as well.

North America to Hold the Largest Share

- The growth in GaN semiconductors market in North America strongly correlates with the growth of end-user industries, such as telecom, aerospace & defense, consumer electronics, automotive, industrial, others.
- Moreover, the presence of leading players in the industry also contributes to the share held by the region. The growth in North America is encouraged by propelling defense sector with wider utilization of GaN-based transistors, military radar and electronic warfare in military applications.
- Also, rising demand from consumer electronic products, such as televisions, laptops, gaming devices, personal computers, and tablet PCs has further fuelled the growth of this market in North America.
- Moreover, expertise in technology has resulted in the growth of convertible laptops, ultra HD or 4K Television sets, and other various wireless electronics, increasing the demand for RF GaN semiconductor in the consumer electronics market of the region.
- According to the Semiconductor Industry Association (SIA) and World Semiconductor Trade Statistics, the semiconductor industry directly employs nearly a quarter of a million workers in the US, and the US semiconductor companies' sales totaled USD 8.05 billion in January 2021.

GaN RF Semiconductor Devices Industry Overview

The GaN RF semiconductor devices market is neither consolidated nor fragmented. Some of the key players include GaN Systems, NXP Semiconductor, Qorvo Inc., Wolfspeed, Inc.(A CREE Company), Broadcom Inc., Efficient Power Conversion, Fujitsu Semiconductor, NTT Advanced Technology, Texas Instruments, among others.

- May 2021 - NXP Semiconductors NV sold bonds worth USD 2 billion to help finance the development of semiconductors that reduce energy consumption in products like power adapters and electric vehicles. This is to achieve a lesser carbon footprint and more energy-efficient production in fabs of semiconductors. NXP said it had cut absolute emissions of perfluorinated compounds (PFCs), which are greenhouse gases, by 66%.

Additional Benefits:

- The market estimate (ME) sheet in Excel format
- 3 months of analyst support

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