

RF GaN Market Forecasts to 2032 – Global Analysis By Material Type (GaN-on-SiC, GaN-on-Silicon, GaN-on-Diamond and Other Materials), Device Type, Wafer Size, Application, End User and By Geography

<https://marketpublishers.com/r/R624817AC4A6EN.html>

Date: June 2025

Pages: 150

Price: US\$ 4,150.00 (Single User License)

ID: R624817AC4A6EN

Abstracts

According to Statistics MRC, the Global RF GaN Market is accounted for \$1.7 billion in 2025 and is expected to reach \$7.2 billion by 2032 growing at a CAGR of 22.2% during the forecast period. 'RF GaN' describes the utilization of gallium nitride semiconductors in radio frequency settings. Compact, high-performance components in satellite communications, radar systems, and wireless infrastructure are made possible by RF GaN, which is well-known for its high breakdown voltage, power density, and efficiency. GaN provides better temperature and frequency performance than conventional materials like silicon or GaAs, which makes it perfect for high-frequency, high-power radio frequency devices.

According to a PwC report, 5G technology is expected to contribute \$1.3 trillion to global GDP by 2030.

Market Dynamics:

Driver:

Rising demand in radar and electronic warfare systems

The escalating demand for radar and electronic warfare systems is a pivotal driver for the RF GaN market. These applications require high-frequency, high-power, and high-efficiency components attributes where GaN excels. The modernization of defense systems globally, especially with the integration of advanced radar and electronic

warfare capabilities, has accelerated the adoption of RF GaN devices. The superior power density and thermal performance of GaN-based solutions make them indispensable for next-generation military and aerospace platforms, fueling robust market growth.

Restraint:

Thermal management challenges

GaN devices operate at higher power densities and frequencies, they generate substantial heat, which can compromise reliability and device lifespan if not effectively dissipated. Moreover, the integration of GaN in compact, high-performance systems intensifies these challenges, necessitating advanced cooling solutions and innovative packaging techniques. These added complexities increase both development costs and time to market, potentially limiting broader adoption, especially in cost-sensitive applications.

Opportunity:

Integration with AI-based defense systems

Advanced AI algorithms, when combined with high-frequency, high-power GaN devices, enable real-time data processing, adaptive signal management, and enhanced threat detection in modern defense platforms. Additionally, the synergy between AI and GaN amplifies the effectiveness of radar, electronic warfare, and communication systems, paving the way for smarter, more autonomous military operations. This convergence is expected to drive significant investments and innovation in the sector.

Threat:

Supply chain disruptions for GaN wafers and substrates

Supply chain disruptions for GaN wafers and substrates pose a considerable threat to the RF GaN market. The reliance on a limited number of suppliers for high-quality GaN materials exposes manufacturers to risks such as geopolitical tensions, natural disasters, and logistical bottlenecks. Furthermore, any interruption in the supply of critical substrates like silicon carbide (SiC) or high-purity GaN can lead to production delays, increased costs, and unmet demand.

Covid-19 Impact:

The COVID-19 pandemic initially disrupted the RF GaN market due to supply chain interruptions and reduced demand from end-use industries. However, the crisis accelerated digitalization, remote work, and the expansion of telecommunications infrastructure, which in turn boosted demand for high-performance RF components. As industries adapted and restrictions eased, sectors such as telecommunications, defense, and consumer electronics regained momentum, leading to a swift recovery and renewed growth in the RF GaN market.

The GaN-on-SiC segment is expected to be the largest during the forecast period

The GaN-on-SiC segment is expected to account for the largest market share during the forecast period due to the superior thermal conductivity, efficiency, and power handling capabilities of GaN-on-SiC devices, which are crucial for high-performance RF applications. Moreover, their ability to operate reliably at elevated power densities and frequencies makes them the preferred choice for demanding sectors such as telecommunications, defense, and aerospace. Continuous advancements in fabrication processes and cost-effectiveness further reinforce the segment's leadership in the market.

The telecommunications segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the telecommunications segment is predicted to witness the highest growth rate. The rapid rollout of 5G networks and the surge in high-speed data communication are driving the adoption of RF GaN devices in this sector. Furthermore, GaN technology's inherent advantages, such as high power density, efficiency, and wide bandwidth, enable enhanced signal integrity and network performance in base stations and infrastructure. As global demand for advanced wireless connectivity rises, the telecommunications segment will continue to outpace other applications in market expansion.

Region with largest share:

During the forecast period, the North America region is expected to hold the largest market share, fueled by the region's advanced defense infrastructure, early adoption of 5G technologies, and significant investments in research and development. Additionally, the presence of major semiconductor manufacturers and robust government support for

advanced communications and defense capabilities further consolidate North America's dominant position.

Region with highest CAGR:

Over the forecast period, the Asia Pacific region is anticipated to exhibit the highest CAGR. The region's rapid industrialization, burgeoning telecommunications infrastructure, and strong manufacturing capabilities drive exceptional demand for RF GaN devices. Moreover, countries such as China, Japan, and South Korea are leading in both the adoption and production of advanced semiconductor technologies. Government initiatives supporting domestic manufacturing and technological innovation further accelerate market growth.

Key players in the market

Some of the key players in RF GaN Market include Cree, Inc. (Wolfspeed), Qorvo, Inc., Skyworks Solutions, Inc., Infineon Technologies AG, MACOM Technology Solutions Holdings, Inc., NXP Semiconductors N.V., STMicroelectronics N.V., Mitsubishi Electric Corporation, Analog Devices, Inc., Panasonic Corporation, Texas Instruments Incorporated, Toshiba Corporation, Sumitomo Electric Industries, Ltd., GaN Systems Inc., Analogic Corporation, United Monolithic Semiconductors (UMS), and Transphorm, Inc.

Key Developments:

In March 2025 – At SATELLITE 2025, MACOM showcased new high power C Band, Q Band, and Ka Band GaN MMIC PAs using PURE CARBIDE™ GaN technology, supporting 125 W and above with improved efficiency.

In January 2025, Infineon Technologies AG a leader in power, automotive and IoT semiconductors announced the formation of a new business unit to drive the company's growth in the area of sensors by combining the existing Sensor and Radio Frequency (RF) businesses into one dedicated organization. The new business unit SURF (Sensor Units & Radio Frequency) will be part of the Power & Sensor Systems (PSS) division and include the former Automotive and Multi-market Sense & Control businesses.

Material Types Covered:

GaN-on-SiC

GaN-on-Silicon

GaN-on-Diamond

Other Material Types

Device Types Covered:

Discrete Devices

Integrated Devices (MMICs)

Wafer Sizes Covered:

Contents

1 EXECUTIVE SUMMARY

2 PREFACE

- 2.1 Abstract
- 2.2 Stake Holders
- 2.3 Research Scope
- 2.4 Research Methodology
 - 2.4.1 Data Mining
 - 2.4.2 Data Analysis
 - 2.4.3 Data Validation
 - 2.4.4 Research Approach
- 2.5 Research Sources
 - 2.5.1 Primary Research Sources
 - 2.5.2 Secondary Research Sources
 - 2.5.3 Assumptions

3 MARKET TREND ANALYSIS

- 3.1 Introduction
- 3.2 Drivers
- 3.3 Restraints
- 3.4 Opportunities
- 3.5 Threats
- 3.6 Application Analysis
- 3.7 End User Analysis
- 3.8 Emerging Markets
- 3.9 Impact of Covid-19

4 PORTERS FIVE FORCE ANALYSIS

- 4.1 Bargaining power of suppliers
- 4.2 Bargaining power of buyers
- 4.3 Threat of substitutes
- 4.4 Threat of new entrants
- 4.5 Competitive rivalry

5 GLOBAL RF GAN MARKET, BY MATERIAL TYPE

- 5.1 Introduction
- 5.2 GaN-on-SiC
- 5.3 GaN-on-Silicon
- 5.4 GaN-on-Diamond
- 5.5 Other Material Types

6 GLOBAL RF GAN MARKET, BY DEVICE TYPE

- 6.1 Introduction
- 6.2 Discrete Devices
- 6.3 Integrated Devices (MMICs)

7 GLOBAL RF GAN MARKET, BY WAFER SIZE

- 7.1 Introduction
- 7.2

List Of Tables

LIST OF TABLES

- Table 1 Global RF GaN Market Outlook, By Region (2024-2032) (\$MN)
- Table 2 Global RF GaN Market Outlook, By Material Type (2024-2032) (\$MN)
- Table 3 Global RF GaN Market Outlook, By GaN-on-SiC (2024-2032) (\$MN)
- Table 4 Global RF GaN Market Outlook, By GaN-on-Silicon (2024-2032) (\$MN)
- Table 5 Global RF GaN Market Outlook, By GaN-on-Diamond (2024-2032) (\$MN)
- Table 6 Global RF GaN Market Outlook, By Other Material Types (2024-2032) (\$MN)
- Table 7 Global RF GaN Market Outlook, By Device Type (2024-2032) (\$MN)
- Table 8 Global RF GaN Market Outlook, By Discrete Devices (2024-2032) (\$MN)
- Table 9 Global RF GaN Market Outlook, By Integrated Devices (MMICs) (2024-2032) (\$MN)
- Table 10 Global RF GaN Market Outlook, By Wafer Size (2024-2032) (\$MN)
- Table 11 Global RF GaN Market Outlook, By

I would like to order

Product name: RF GaN Market Forecasts to 2032 – Global Analysis By Material Type (GaN-on-SiC, GaN-on-Silicon, GaN-on-Diamond and Other Materials), Device Type, Wafer Size, Application, End User and By Geography

Product link: <https://marketpublishers.com/r/R624817AC4A6EN.html>

Price: US\$ 4,150.00 (Single User License / Electronic Delivery)

If you want to order Corporate License or Hard Copy, please, contact our Customer Service:

info@marketpublishers.com

Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page <https://marketpublishers.com/r/R624817AC4A6EN.html>