

GaN Semiconductor Device Market Opportunity, Growth Drivers, Industry Trend Analysis, and Forecast 2025-2034

Market Report | 2025-02-24 | 210 pages | Global Market Insights

AVAILABLE LICENSES:

- Single User \$4850.00
- Multi User \$6050.00
- Enterprise User \$8350.00

Report description:

The Global GaN Semiconductor Device Market reached USD 22.6 billion in 2024 and is projected to expand at a CAGR of 6.8% from 2025 to 2034. The rising demand for high-performance, energy-efficient electronic components is fueling market growth, as GaN technology continues to gain traction across multiple industries. With its superior electrical properties, GaN enables faster processing speeds, improved energy efficiency, and greater power density compared to traditional silicon-based semiconductors. The increasing adoption of GaN in applications such as electric vehicles, wireless charging, and high-frequency communication networks is positioning it as a key enabler of next-generation technology. Additionally, as industries move toward sustainability and energy efficiency, GaN's ability to reduce power losses and enhance system performance makes it a preferred choice among manufacturers. These advantages are leading to increased investments in GaN research and development, further accelerating its commercialization and widespread adoption.

A significant driver of GaN semiconductor device demand is its growing integration into consumer electronics. Companies are leveraging GaN's capability to improve power efficiency while enabling smaller, more compact form factors. This allows manufacturers to develop high-performance products with reduced system costs, making GaN a preferred material for chargers, power supplies, and emerging electric vehicle technologies. The ability to incorporate GaN into various consumer and industrial applications continues to elevate its appeal, driving widespread market penetration.

The GaN semiconductor device market is categorized by product type into opto-semiconductors, RF semiconductors, and power semiconductors. Power semiconductors alone accounted for USD 9.4 billion in 2024, reflecting their essential role in high-efficiency applications. GaN's ability to operate at higher voltages and temperatures than conventional semiconductor materials makes it ideal for demanding sectors such as data centers, renewable energy systems, and electric vehicles. As companies seek to improve power management solutions, GaN power semiconductors are expected to witness sustained demand and innovation.

Scotts International. EU Vat number: PL 6772247784

tel. 0048 603 394 346 e-mail: support@scotts-international.com

www.scotts-international.com

From a component perspective, the market is segmented into transistors, diodes, rectifiers, power ICs, and others. GaN transistors, in particular, play a crucial role in power amplification at microwave frequencies, making them indispensable for advanced technological applications. As of 2024, transistors represented 36.3% of the GaN semiconductor device market, reflecting their growing importance in applications requiring high-temperature operation and superior efficiency. These attributes are crucial for industries such as telecommunications, aerospace, and defense, where reliable, high-performance semiconductor components are vital.

The U.S. GaN Semiconductor Device Market reached a valuation of USD 5.3 billion in 2024, underscoring the country's leadership in GaN technology. With a strong emphasis on commercial and national security advantages, the U.S. is at the forefront of GaN innovation. The defense sector, in particular, has integrated GaN into critical applications such as radar systems and electronic warfare technologies. Additionally, the rapid deployment of 5G and the anticipated evolution to 6G networks further highlight GaN's strategic importance in high-frequency communication infrastructure. As industries continue to prioritize efficiency, speed, and performance, GaN technology is expected to play a pivotal role in shaping the future of semiconductor advancements.

Table of Contents:

Report Content

Chapter 1 Methodology & Scope

- 1.1 Market scope & definitions
- 1.2 Base estimates & calculations
- 1.3 Forecast calculations
- 1.4 Data sources
 - 1.4.1 Primary
 - 1.4.2 Secondary
 - 1.4.2.1 Paid sources
 - 1.4.2.2 Public sources

Chapter 2 Executive Summary

2.1 Industry synopsis, 2021-2034

Chapter 3 Industry Insights

- 3.1 Industry ecosystem analysis
 - 3.1.1 Factor affecting the value chain
 - 3.1.2 Profit margin analysis
 - 3.1.3 Disruptions
 - 3.1.4 Future outlook
 - 3.1.5 Manufacturers
 - 3.1.6 Distributors
- 3.2 Supplier landscape
- 3.3 Profit margin analysis
- 3.4 Key news & initiatives
- 3.5 Regulatory landscape
- 3.6 Impact forces
 - 3.6.1 Growth drivers
 - 3.6.1.1 Increasing adoption of GaN in consumer electronics
 - 3.6.1.2 Growing integration in the automotive industry
 - 3.6.1.3 Rising demand for high-speed data transmission
 - 3.6.1.4 Surging deployment in the energy and power industry

Scotts International. EU Vat number: PL 6772247784

tel. 0048 603 394 346 e-mail: support@scotts-international.com

www.scotts-international.com

- 3.6.2 Industry pitfalls & challenges
 - 3.6.2.1 High manufacturing costs
 - 3.6.2.2 Thermal management challenges
- 3.7 Growth potential analysis
- 3.8 Porter's analysis
- 3.9 PESTEL analysis
- Chapter 4 Competitive Landscape, 2024
 - 4.1 Introduction
 - 4.2 Company market share analysis
 - 4.3 Competitive positioning matrix
 - 4.4 Strategic outlook matrix
- Chapter 5 Market Estimates & Forecast, By Type, 2021-2034 (USD Billion)
 - 5.1 Key trends
 - 5.2 Opto-semiconductors
 - 5.3 RF semiconductors
 - 5.4 Power semiconductors
- Chapter 6 Market Estimates & Forecast, By Component, 2021-2034 (USD Billion)
 - 6.1 Key trends
 - 6.2 Transistor
 - 6.3 Diode
 - 6.4 Rectifier
 - 6.5 Power IC
 - 6.6 Others
- Chapter 7 Market Estimates & Forecast, By Voltage Range, 2021-2034 (USD Billion)
 - 7.1 Key trends
 - 7.2 Less than 100 V
 - 7.3 100-500 V
 - 7.4 More than 500 V
- Chapter 8 Market Estimates & Forecast, By End Use Industry, 2021-2034 (USD Billion)
 - 8.1 Key trends
 - 8.2 Aerospace & defense
 - 8.3 Automotive
 - 8.4 Consumer electronics
 - 8.5 Energy & power
 - 8.6 Healthcare
 - 8.7 Industrial
 - 8.8 IT & telecommunications
 - 8.9 Others
- Chapter 9 Market Estimates & Forecast, By Region, 2021-2034 (USD Billion)
 - 9.1 Key trends
 - 9.2 North America
 - 9.2.1 U.S.
 - 9.2.2 Canada
 - 9.3 Europe
 - 9.3.1 UK
 - 9.3.2 Germany
 - 9.3.3 France

Scotts International. EU Vat number: PL 6772247784

tel. 0048 603 394 346 e-mail: support@scotts-international.com

www.scotts-international.com

- 9.3.4 Italy
- 9.3.5 Spain
- 9.3.6 Russia
- 9.4 Asia Pacific
 - 9.4.1 China
 - 9.4.2 India
 - 9.4.3 Japan
 - 9.4.4 South Korea
 - 9.4.5 Australia
- 9.5 Latin America
 - 9.5.1 Brazil
 - 9.5.2 Mexico
- 9.6 MEA
 - 9.6.1 South Africa
 - 9.6.2 Saudi Arabia
 - 9.6.3 UAE
- Chapter 10 Company Profiles
 - 10.1 Aixtron SE
 - 10.2 Analog Devices
 - 10.3 Broadcom Inc.
 - 10.4 Efficient Power Conversion (EPC)
 - 10.5 Fuji Electric Co., Ltd.
 - 10.6 GaN Systems
 - 10.7 Infineon Technologies AG
 - 10.8 Kyocera Corporation
 - 10.9 MACOM Technology Solutions
 - 10.10 Mitsubishi Electric Corporation
 - 10.11 NXP Semiconductors
 - 10.12 Odyssey Semiconductor Technologies, Inc.
 - 10.13 ON Semiconductor
 - 10.14 Power Integrations
 - 10.15 Qorvo, Inc.
 - 10.16 Qualcomm
 - 10.17 Renesas Electronics Corporation
 - 10.18 Rohm Semiconductor
 - 10.19 Sanken Electric Co., Ltd.
 - 10.20 Skyworks Solutions
 - 10.21 STMicroelectronics
 - 10.22 Sumitomo Electric Industries Ltd.
 - 10.23 Texas Instruments
 - 10.24 Toshiba Corporation
 - 10.25 Wolfspeed

□

Scotts International. EU Vat number: PL 6772247784

tel. 0048 603 394 346 e-mail: support@scotts-international.com

www.scotts-international.com

GaN Semiconductor Device Market Opportunity, Growth Drivers, Industry Trend Analysis, and Forecast 2025-2034

Market Report | 2025-02-24 | 210 pages | Global Market Insights

To place an Order with Scotts International:

- ☐ - Print this form
- ☐ - Complete the relevant blank fields and sign
- ☐ - Send as a scanned email to support@scotts-international.com

ORDER FORM:

Select license	License	Price
	Single User	\$4850.00
	Multi User	\$6050.00
	Enterprise User	\$8350.00
		VAT
		Total

*Please circle the relevant license option. For any questions please contact support@scotts-international.com or 0048 603 394 346.

☐ ** VAT will be added at 23% for Polish based companies, individuals and EU based companies who are unable to provide a valid EU Vat Numbers.

Email*	<input type="text"/>	Phone*	<input type="text"/>
First Name*	<input type="text"/>	Last Name*	<input type="text"/>
Job title*	<input type="text"/>		
Company Name*	<input type="text"/>	EU Vat / Tax ID / NIP number*	<input type="text"/>
Address*	<input type="text"/>	City*	<input type="text"/>
Zip Code*	<input type="text"/>	Country*	<input type="text"/>
		Date	<input type="text" value="2025-05-09"/>
		Signature	

Scotts International. EU Vat number: PL 6772247784

tel. 0048 603 394 346 e-mail: support@scotts-international.com

www.scotts-international.com



Scotts International. EU Vat number: PL 6772247784

tel. 0048 603 394 346 e-mail: support@scotts-international.com
www.scotts-international.com