

Gallium Nitride Market - A Global and Regional Analysis: Focus on Application, Substrate Type, and Country-Wise Analysis - Analysis and Forecast, 2021-2031

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Abstracts

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Market Report Coverage - Gallium Nitride

Market Segmentation

Application: Radiofrequency (RF) Devices, Optoelectronics, Power Electronics

Substrate Type: GaN-on-Si, GaN-on-Sapphire, GaN-on-SiC, Others

Regional Segmentation

North America: U.S., Canada, and Mexico

Europe: Germany, France, Netherlands, and Rest-of-Europe

U.K.

China

Asia-Pacific and Japan: Japan, South Korea, Taiwan, and Rest-of-Asia-Pacific

Rest-of-the-World: South America and Middle East and Africa

Market Growth Drivers

GaN Technology Propelling the Growth of Electric Vehicles Efficiency

Continuous Emergence of Technologies in GaN Ecosystem

Suitability of GaN in RF Applications

Increasing Adoption of GaN RF Semiconductor Devices for Defense and Aerospace Applications

Glass-Like Material and GaN Holding the Potential to Sweep off Silicon from the Market

Market Challenges

Higher Efficacy of GaN Alternative Such as Silicon Carbide for High-Voltage Semiconductor Applications

Limited Production of GaN May Act as a Hindrance to the Growth of GaN

Market Opportunities

Potential Use of GaN in 5G Infrastructure Development

GaN Technology Strike a Ray of Advancement for Space Industry

Key Companies Profiled

Wolfspeed, Inc., Furukawa Co., Ltd., IQE PLC, Infineon Technologies AG, Mitsubishi Chemical Corporation, SOITEC, FUJITSU, Qorvo, Inc., Semiconductor Components Industries, LLC, American Elements, Taiwan Semiconductor Manufacturing Company Limited, DOWA Electronics Materials Co., Ltd., Kyma Technologies, Inc., Powdec K.K.,

Shanghai Famous Trade Co., Ltd.

How This Report Can Add Value

This report will help with the following objectives:

A dedicated section focusing on the futuristic trends adopted by the key players operating in the global gallium nitride market

Extensive competitive benchmarking of top 15 players (including producers and component providers) offering a holistic view of the global gallium nitride landscape

Qualitative and quantitative analysis of gallium nitride industry at country level granularity based on region, application, and substrate type segments

Market by Product: Analysis and Forecast: The product segment helps the reader in understanding different types of substrate types (GaN-on-Si, GaN-on-Sapphire, GaN-on-SiC, others) associated with gallium nitride.

Market by Application: Analysis and Forecast: The report also includes a thorough qualitative and quantitative analysis of various application areas such as RF devices (wireless infrastructure, aerospace and defense, satellite communication, point-to-point-radio, others), optoelectronics (LED, laser, others), power electronics (power supply, EV/HEV, LiDAR, server and data centers, wireless power, solar photovoltaic, envelop tracking, UV detector, others).

Key Questions Answered in the Report

What are the major factors and trends that are impacting the gallium nitride market, and how the COVID-19 has affected the market?

What are the steps taken by the existing players to improve their market positioning, and is there any substitute used in the end-use industry for gallium nitride?

Which are the leading types and applications in the market, and how are they expected to perform in the coming years?

What are the latest developments across the globe with respect to research and development, and what would be the trending technology used in the gallium nitride market?

What are the consumption patterns of gallium nitride across different regions and countries? Moreover, is there any government regulation across the globe impacting the gallium nitride market?

Gallium Nitride Market

Gallium nitride (GaN) is a very hard and mechanically stable wide bandgap (WBG) semiconductor, as it has a hexagonal crystal structure. The critical factors of gallium nitride material responsible for its adoption in the market are reliability, compact size, high efficiency, fast switching speed, low on-resistance, and high thermal conductivity, among other types of semiconductors such as silicon (Si) and silicon carbide (SiC).

The gallium nitride market has been developing significantly since 1990, and much can be attributed to the technological advancements in this field. The ecosystem of the gallium nitride market comprises GaN wafers manufacturers, GaN epitaxy producers, GaN device processing companies, GaN module manufacturers, and end users. The market is still developing, with North America at the forefront, followed by Europe, Asia-Pacific, the U.K., China, and Rest-of-the-World.

Gallium Nitride Industry Overview

The global gallium nitride market was valued at \$270.00 million in 2020 and is expected to reach \$2,956.03 million by 2031, growing at a CAGR of 24.65% between 2021 and 2031. The gallium nitride market is driven by several factors such as use of GaN in electric vehicles to increase their efficiency, continuous technological advancement in GaN ecosystem, suitability of GaN in radio frequency (RF) applications, and its property which can sweep off silicon from the market.

Market Segmentation

Gallium Nitride Market by Application

Among different gallium nitride applications, RF devices dominate the market and are

expected to be the largest application during the forecast period. The growing use of gallium nitride in the RF devices application segment is majorly subjected to its high-performance, high-efficiency delivery, and reliable semiconductor material for these devices. Companies working on GaN-based RF devices are investing heavily in the research and development of gallium nitride technology.

Gallium Nitride Market by Substrate Type

Among different gallium nitride substrate types, GaN-on-Si dominates the market and is expected to be the largest substrate type during the forecast period. The dominance of GaN-on-Si substrate is attributed to wide use in the applications of gallium nitride such as RF devices (wireless infrastructure, aerospace and defense, satellite communication, point-to-point-radio, others), optoelectronics (LED, laser, others), power electronics (power supply, EV/HEV, LiDAR, server and data centers, wireless power, solar photovoltaic, envelop tracking, UV detector, others).

This substrate is widely accepted by the electronic industry, which prefers bulk substrates for commercializing its GaN-based products. However, GaN-on-Si is being preferred over GaN-on-SiC. Ongoing research work is being conducted to remove cost restraints, to deliver high-quality devices based on Si substrate material. GaN-on-Si devices offer high voltage features on appreciably reduced chip sizes.

Gallium Nitride Market by Region

The demand for gallium nitride varies according to various regions. The gallium nitride market holds a prominent share in various countries of North America, Asia-Pacific and Japan, Europe, the U.K., China, and Rest-of-the-World, among which North America was the largest region for gallium nitride market in 2020 in terms of value.

Industrial advancements, extensive investments for dedicated R&D facilities, and the development of different application products that require gallium nitride are some of the major drivers that are currently propelling the growth of the global gallium nitride market in North America.

Key Market Players and Competition Synopsis

Wolfspeed, Inc., Furukawa Co., Ltd., IQE PLC, Infineon Technologies AG, Mitsubishi Chemical Corporation, SOITEC, FUJITSU, Qorvo, Inc., Semiconductor Components Industries, LLC, American Elements, Taiwan Semiconductor Manufacturing Company

Limited, DOWA Electronics Materials Co., Ltd., Kyma Technologies, Inc., Powdec K.K., Shanghai Famous Trade Co., Ltd.

The companies that are profiled in the report have been selected based on a selective pool of players, primarily Tier-1 (holding 50-60% of the market) and mid-segment players (comprising 30-40% share), and small and emerging companies (holding the balance 10-20% share), based on various factors such as product portfolios, annual revenues, market penetrations, research, and development initiatives, along with a domestic and international presence in the gallium nitride industry.

Contents

1 MARKETS

1.1 Industry Outlook

- 1.1.1 Trends: Current and Future
- 1.1.2 Supply Chain Network
- 1.1.3 Industry Attractiveness
 - 1.1.3.1 Threat of New Entrants (Moderate)
 - 1.1.3.2 Bargaining Power of Buyers (Moderate)
 - 1.1.3.3 Bargaining Power of Suppliers (Moderate)
 - 1.1.3.4 Threat of Substitutes (High)
 - 1.1.3.5 Intensity of Competitive Rivalry (Moderate-High)

1.2 Market Dynamics

- 1.2.1 Market Drivers
 - 1.2.1.1 GaN Technology Propelling the Growth of Electric Vehicles Efficiency
 - 1.2.1.2 Continuous Emergence of Technologies in GaN Ecosystem
 - 1.2.1.3 Suitability of GaN in RF Applications
 - 1.2.1.4 Increasing Adoption of GaN RF Semiconductor Devices for Defense and Aerospace Applications
 - 1.2.1.5 Glass-Like Material and GaN Holding the Potential to Sweep off Silicon from the Market
- 1.2.2 Market Restraints
 - 1.2.2.1 Higher Efficacy of GaN Alternative Such as Silicon Carbide for High-Voltage Semiconductor Applications
 - 1.2.2.2 Limited Production of GaN May Act as a Hindrance to the Growth of GaN
- 1.2.3 Market Opportunities
 - 1.2.3.1 Potential Use of GaN in 5G Infrastructure Development
 - 1.2.3.2 GaN Technology Strike a Ray of Advancement for Space Industry
- 1.2.4 Business Strategies
 - 1.2.4.1 Product Development
 - 1.2.4.2 Market Development
- 1.2.5 Corporate Strategies
- 1.2.6 Market Share Analysis
- 1.2.7 Impact of COVID-19 on the Global Gallium Nitride Market

2 APPLICATION

2.1 Global Gallium Nitride Market (by Application, Sub-Application, and Specification)

2.2 Demand Analysis of Global Gallium Nitride Market (by Application and Sub-Application), Value and Volume Data

2.2.1 Radiofrequency (RF) Devices

2.2.1.1 Wireless Infrastructure

2.2.1.2 Aerospace and Defense

2.2.1.3 Satellite Communication

2.2.1.4 Point-to-Point Radio

2.2.1.5 Others

2.2.2 Optoelectronics

2.2.2.1 Light-Emitting Diode (LED)

2.2.2.2 Laser

2.2.2.3 Others

2.2.3 Power Electronics

2.2.3.1 Power Supply

2.2.3.2 Electric Vehicles (EVs)/Hybrid Electric Vehicles (HEVs)

2.2.3.3 Light Detection and Ranging (LiDAR)

2.2.3.4 Server and Data Centers

2.2.3.5 Wireless Power

2.2.3.6 Solar Photovoltaic

2.2.3.7 Envelop Tracking

2.2.3.8 Ultraviolet (UV) Detectors

2.2.3.9 Others

3 PRODUCTS

3.1 Global Gallium Nitride Market (by Product and Specifications)

3.2 Demand Analysis of Global Gallium Nitride Market (by Substrate Type), Value and Volume Data

3.2.1 GaN-on-SiC

3.2.2 GaN-on-Sapphire

3.2.3 GaN-on-Si

3.2.4 Others

3.2.4.1 GaN-on-Diamond

3.2.4.2 GaN-on-GaN

3.3 Patent Analysis

3.3.1.1 Patent Analysis (by Status)

3.3.1.2 Patent Analysis (by Organization)

3.4 Product Benchmarking (by Substrate Type)

3.5 Country Share Analysis

3.6 Parent Market Outlook (Wide Bandgap Materials Market)

3.7 SiC Vs. GaN Technology

3.7.1 Technological Differences

3.7.2 Cost Difference

4 REGION

4.1 North America

4.1.1 Market

4.1.1.1 Key Manufacturers and Suppliers in North America

4.1.1.2 Business Drivers

4.1.1.3 Business Challenges

4.1.2 Region

4.1.2.1 North America Gallium Nitride Market (by Region), Value and Volume Data

4.1.3 Application

4.1.3.1 North America Gallium Nitride Market (by Application and Sub-Application), Value and Volume Data

4.1.4 Product

4.1.4.1 North America Gallium Nitride Market (by Substrate Type), Value and Volume Data

4.1.5 North America (by Country)

4.1.5.1 U.S.

4.1.5.1.1 Market

4.1.5.1.1.1 Buyer Attributes

4.1.5.1.1.2 Key Manufacturers and Suppliers in the U.S.

4.1.5.1.1.3 Business Challenges

4.1.5.1.1.4 Business Drivers

4.1.6 Application

4.1.6.1 U.S. Gallium Nitride Market (by Application and Sub-Application), Value and Volume Data

4.1.7 Product

4.1.7.1 U.S. Gallium Nitride Market (by Substrate Type), Value and Volume Data

4.1.7.2 Canada

4.1.7.2.1 Market

4.1.7.2.1.1 Buyer Attributes

4.1.7.2.1.2 Key Manufacturers and Suppliers in Canada

4.1.7.2.1.3 Business Challenges

4.1.7.2.1.4 Business Drivers

4.1.8 Application

4.1.8.1 Canada Gallium Nitride Market (by Application and Sub-Application), Value and Volume Data

4.1.9 Product

4.1.9.1 Canada Gallium Nitride Market (by Substrate Type), Value and Volume Data

4.1.9.2 Mexico

4.1.9.2.1.1 Buyer Attributes

4.1.9.2.1.2 Key Manufacturers and Suppliers in Mexico

4.1.9.2.1.3 Business Challenges

4.1.9.2.1.4 Business Drivers

4.1.10 Application

4.1.10.1 Mexico Gallium Nitride Market (by Application and Sub-Application), Value and Volume Data

4.1.11 Product

4.1.11.1 Mexico Gallium Nitride Market (by Substrate Type), Value and Volume Data

4.2 Europe

4.2.1 Market

4.2.1.1 Key Manufacturers and Suppliers in Europe

4.2.1.2 Business Drivers

4.2.1.3 Business Challenges

4.2.2 Region

4.2.2.1 Europe Gallium Nitride Market (by Region), Value and Volume Data

4.2.3 Application

4.2.3.1 Europe Gallium Nitride Market (by Application and Sub-Application), Value and Volume Data

4.2.4 Product

4.2.4.1 Europe Gallium Nitride Market (by Substrate Type), Value and Volume Data

4.2.5 Europe (by Country)

4.2.5.1 Germany

4.2.5.1.1 Market

4.2.5.1.1.1 Buyer Attributes

4.2.5.1.2 Key Manufacturers and Suppliers in Germany

4.2.5.1.3 Business Challenges

4.2.5.1.4 Business Drivers

4.2.6 Application

4.2.6.1 Germany Gallium Nitride Market (by Application and Sub-Application), Value and Volume Data

4.2.7 Product

4.2.7.1 Germany Gallium Nitride Market (by Substrate Type), Value and Volume Data

4.2.7.2 France

4.2.7.2.1 Market

4.2.7.2.1.1 Buyer Attributes

4.2.7.2.1.2 Key Manufacturers and Suppliers in France

4.2.7.2.1.3 Business Challenges

4.2.7.2.1.4 Business Drivers

4.2.8 Application

4.2.8.1 France Gallium Nitride Market (by Application and Sub-Application), Value and Volume Data

4.2.9 Product

4.2.9.1 France Gallium Nitride Market (by Substrate Type), Value and Volume Data

4.2.9.2 Netherlands

4.2.9.2.1 Market

4.2.9.2.1.1 Buyer Attributes

4.2.9.2.1.2 Key Manufacturers and Suppliers in Netherlands

4.2.9.2.1.3 Business Challenges

4.2.9.2.1.4 Business Drivers

4.2.10 Application

4.2.10.1 Netherlands Gallium Nitride Market (by Application and Sub-Application), Value and Volume Data

4.2.11 Product

4.2.11.1 Netherlands Gallium Nitride Market (by Substrate Type), Value and Volume Data

4.2.11.2 Rest-of-Europe

4.2.12 Application

4.2.12.1 Rest-of-Europe Gallium Nitride Market (by Application and Sub-Application), Value and Volume Data

4.2.13 Product

4.2.13.1 Rest-of-Europe Gallium Nitride Market (by Substrate Type), Value and Volume Data

4.3 U.K.

4.3.1 Market

4.3.1.1 Buyer Attributes

4.3.1.2 Key Manufacturers and Suppliers in the U.K.

4.3.1.3 Business Challenges

4.3.1.4 Business Drivers

4.3.2 Region

4.3.2.1 U.K. Gallium Nitride Market (by Region), Value and Volume Data

4.3.3 Application

4.3.3.1 U.K. Gallium Nitride Market (by Application and Sub-Application), Value and

Volume Data

4.3.4 Product

4.3.4.1 U.K. Gallium Nitride Market (by Substrate Type), Value and Volume Data

4.4 China

4.4.1 Market

4.4.1.1 Buyer Attributes

4.4.1.2 Key Manufacturers and Suppliers in China

4.4.1.3 Business Challenges

4.4.1.4 Business Drivers

4.4.2 Region

4.4.2.1 China Gallium Nitride Market (by Region), Value and Volume Data

4.4.3 Application

4.4.3.1 China Gallium Nitride Market (by Application and Sub-Application), Value and

Volume Data

4.4.4 Product

4.4.4.1 China Gallium Nitride Market (by Substrate Type), Value and Volume Data

4.5 Asia-Pacific and Japan

4.5.1 Market

4.5.1.1 Key Manufacturers and Suppliers in Asia-Pacific and Japan

4.5.1.2 Business Drivers

4.5.1.3 Business Challenges

4.5.2 Region

4.5.2.1 Asia-Pacific and Japan Gallium Nitride Market (by Region), Value and Volume

Data

4.5.3 Application

4.5.3.1 Asia-Pacific and Japan Gallium Nitride Market (by Application and Sub-Application), Value and Volume Data

4.5.4 Product

4.5.4.1 Asia-Pacific and Japan Gallium Nitride Market (by Substrate Type), Value and Volume Data

4.5.5 Asia-Pacific (by Country)

4.5.5.1 Japan

4.5.6 Market

4.5.6.1 Buyer Attributes

4.5.6.2 Key Manufacturers and Suppliers in Japan

4.5.6.3 Business Challenges

4.5.6.4 Business Drivers

4.5.7 Application

4.5.7.1 Japan Gallium Nitride Market (by Application and Sub-Application), Value and

Volume Data

4.5.8 Product

4.5.8.1 Japan Gallium Nitride Market (by Substrate Type), Value and Volume Data

4.5.8.2 South Korea

4.5.9 Market

4.5.9.1 Buyer Attributes

4.5.9.2 Key Manufacturers and Suppliers in South Korea

4.5.9.3 Business Challenges

4.5.9.4 Business Drivers

4.5.10 Application

4.5.10.1 South Korea Gallium Nitride Market (by Application and Sub-Application),

Value and Volume Data

4.5.11 Product

4.5.11.1 South Korea Gallium Nitride Market (by Substrate Type), Value and Volume Data

4.5.11.2 Taiwan

4.5.12 Market

4.5.12.1 Buyer Attributes

4.5.12.2 Key Manufacturers and Suppliers in Taiwan

4.5.12.3 Business Challenges

4.5.12.4 Business Drivers

4.5.13 Application

4.5.13.1 Taiwan Gallium Nitride Market (by Application and Sub-Application), Value and Volume Data

4.5.14 Product

4.5.14.1 Taiwan Gallium Nitride Market (by Substrate Type), Value and Volume Data

4.5.14.2 Rest-of-Asia-Pacific

4.5.15 Application

4.5.15.1 Rest-of-Asia-Pacific Gallium Nitride Market (by Application and Sub-Application), Value and Volume Data

4.5.16 Product

4.5.16.1 Rest-of-Asia-Pacific Gallium Nitride Market (by Substrate Type), Value and Volume Data

4.6 Rest-of-the-World

4.6.1 Market

4.6.1.1 Key Manufacturers and Suppliers in Rest-of-the-World

4.6.1.2 Business Drivers

4.6.1.3 Business Challenges

4.6.2 Region

4.6.2.1 Rest-of-the-World Gallium Nitride Market (by Region), Value and Volume Data

4.6.3 Application

4.6.3.1 Rest-of-the-World Gallium Nitride Market (by Application and Sub-Application), Value and Volume Data

4.6.4 Product

4.6.4.1 Rest-of-the-World Gallium Nitride Market (by Substrate Type), Value and Volume Data

4.6.4.2 South America

4.6.5 Market

4.6.5.1 Buyer Attributes

4.6.5.2 Key Manufacturers and Suppliers in South America

4.6.5.3 Business Challenges

4.6.5.4 Business Drivers

4.6.6 Application

4.6.6.1 South America Gallium Nitride Market (by Application and Sub-Application), Value and Volume Data

4.6.7 Product

4.6.7.1 South America Gallium Nitride Market (by Substrate Type), Value and Volume Data

4.6.7.2 Middle East and Africa

4.6.8 Market

4.6.8.1 Buyer Attributes

4.6.8.2 Key Manufacturers and Suppliers in the Middle East and Africa

4.6.8.3 Business Challenges

4.6.8.4 Business Drivers

4.6.9 Application

4.6.9.1 Middle East and Africa Gallium Nitride Market (by Application and Sub-Application), Value and Volume Data

4.6.10 Product

4.6.10.1 Middle East and Africa Gallium Nitride Market (by Substrate Type), Value and Volume Data

5 MARKETS - COMPETITIVE BENCHMARKING & COMPANY PROFILES

5.1 Competitive Benchmarking

5.2 Company Profiles

5.2.1 Wolfspeed, Inc.

5.2.1.1 Company Overview

- 5.2.1.2 Product Portfolio
- 5.2.1.3 Corporate Strategies
- 5.2.1.4 Production Sites and R&D Analysis
- 5.2.1.5 Strengths of the Company in the Global Gallium Nitride Market
- 5.2.1.6 Weaknesses of the Company in the Global Gallium Nitride Market
- 5.2.2 Furukawa Co., Ltd.
 - 5.2.2.1 Company Overview
 - 5.2.2.2 Product Portfolio
 - 5.2.2.3 Production Sites and R&D Analysis
 - 5.2.2.4 Strengths of the Company in the Global Gallium Nitride Market
 - 5.2.2.5 Weaknesses of the Company in the Global Gallium Nitride Market
- 5.2.3 IQE PLC
 - 5.2.3.1 Company Overview
 - 5.2.3.2 Product Portfolio
 - 5.2.3.3 Corporate Strategies
 - 5.2.3.4 Production Sites and R&D Analysis
 - 5.2.3.5 Strengths of the Company in the Global Gallium Nitride Market
 - 5.2.3.6 Weaknesses of the Company in the Global Gallium Nitride Market
- 5.2.4 Infineon Technologies AG
 - 5.2.4.1 Company Overview
 - 5.2.4.2 Product Portfolio
 - 5.2.4.3 Corporate Strategies
 - 5.2.4.4 Production Sites and R&D Analysis
 - 5.2.4.5 Strengths of the Company in the Global Gallium Nitride Market
 - 5.2.4.6 Weakness of the Company in the Global Gallium Nitride Market
- 5.2.5 Mitsubishi Chemical Corporation
 - 5.2.5.1 Company Overview
 - 5.2.5.2 Product Portfolio
 - 5.2.5.3 Corporate Strategies
 - 5.2.5.4 Strengths of the Company in the Global Gallium Nitride Market
 - 5.2.5.5 Weakness of the Company in the Global Gallium Nitride Market
- 5.2.6 SOITEC
 - 5.2.6.1 Company Overview
 - 5.2.6.2 Product Portfolio
 - 5.2.6.3 Corporate Strategies
 - 5.2.6.4 Production Sites and R&D Analysis
 - 5.2.6.5 Strengths of the Company in the Global Gallium Nitride Market
 - 5.2.6.6 Weaknesses of the Company in the Global Gallium Nitride Market
- 5.2.7 FUJITSU

- 5.2.7.1 Company Overview
- 5.2.7.2 Product Portfolio
- 5.2.7.3 Corporate Strategies
- 5.2.7.4 Production Sites and R&D Analysis
- 5.2.7.5 Strengths of the Company in the Global Gallium Nitride Market
- 5.2.7.6 Weaknesses of the Company in the Global Gallium Nitride Market
- 5.2.8 Qorvo, Inc.
 - 5.2.8.1 Company Overview
 - 5.2.8.2 Product Portfolio
 - 5.2.8.3 Corporate Strategies
 - 5.2.8.4 Production Sites and R&D Analysis
 - 5.2.8.5 Strengths of the Company in the Global Gallium Nitride Market
 - 5.2.8.6 Weakness of the Company in the Global Gallium Nitride Market
- 5.2.9 Semiconductor Components Industries, LLC
 - 5.2.9.1 Company Overview
 - 5.2.9.2 Product Portfolio
 - 5.2.9.3 Corporate Strategies
 - 5.2.9.4 Production Sites and R&D Analysis
 - 5.2.9.5 Strengths of the Company in the Global Gallium Nitride Market
 - 5.2.9.6 Weaknesses of the Company in the Global Gallium Nitride Market
- 5.2.10 American Elements
 - 5.2.10.1 Company Overview
 - 5.2.10.2 Product Portfolio
 - 5.2.10.3 Strengths of the Company in the Global Gallium Nitride Market
 - 5.2.10.4 Weakness of the Company in the Global Gallium Nitride Market
- 5.2.11 Taiwan Semiconductor Manufacturing Company Limited
 - 5.2.11.1 Company Overview
 - 5.2.11.2 Product Portfolio
 - 5.2.11.3 Corporate Strategies
 - 5.2.11.4 Production Sites and R&D Analysis
 - 5.2.11.5 Strengths of the Company in the Global Gallium Nitride Market
 - 5.2.11.6 Weaknesses of the Company in the Global Gallium Nitride Market
- 5.2.12 DOWA Electronics Materials Co., Ltd.
 - 5.2.12.1 Company Overview
 - 5.2.12.2 Product Portfolio
 - 5.2.12.3 Strength of the Company in the Global Gallium Nitride Market
 - 5.2.12.4 Weakness of the Company in the Global Gallium Nitride Market
- 5.2.13 Kyma Technologies, Inc.
 - 5.2.13.1 Company Overview

- 5.2.13.2 Product Portfolio
- 5.2.13.3 Strength of the Company in the Global Gallium Nitride Market
- 5.2.13.4 Weakness of the Company in the Global Gallium Nitride Market
- 5.2.14 Powdec K.K.
 - 5.2.14.1 Company Overview
 - 5.2.14.2 Product Portfolio
 - 5.2.14.3 Strength of the Company in the Global Gallium Nitride Market
 - 5.2.14.4 Weakness of the Company in the Global Gallium Nitride Market
- 5.2.15 Shanghai Famous Trade Co., Ltd.
 - 5.2.15.1 Company Overview
 - 5.2.15.2 Product Portfolio
 - 5.2.15.3 Strength of the Company in the Global Gallium Nitride Market
 - 5.2.15.4 Weakness of the Company in the Global Gallium Nitride Market

6 RESEARCH METHODOLOGY

- 6.1 Data Sources
 - 6.1.1 Primary Data Sources
 - 6.1.2 BIS Research Analysis
- 6.2 Data Triangulation
- 6.3 Market Estimation and Forecast
 - 6.3.1 Factors for Data Prediction and Modeling

List Of Figures

LIST OF FIGURES

- Figure 1: Global Gallium Nitride Market Snapshot, \$Million, 2020, 2021 and 2031
- Figure 2: Global Gallium Nitride Market (by Substrate Type), \$Million, 2020
- Figure 3: Global Gallium Nitride Market (by Region), \$Million, 2021 and 2031
- Figure 4: Global Gallium Nitride Market Coverage
- Figure 5: Supply Chain Analysis of Global Gallium Nitride Market
- Figure 6: Porter's Five Forces Analysis
- Figure 7: Global Gallium Nitride Market Dynamics
- Figure 8: Global Gallium Nitride Market Share Analysis, 2020
- Figure 9: Patent Analysis (by Year), January 2018-October 2021
- Figure 10: Patent Analysis (by Status), January 2018-October 2021
- Figure 11: Patent Analysis (by Organization), January 2018-October 2021
- Figure 12: Product Benchmarking
- Figure 13: Country Share Analysis of the Global Gallium Nitride Market, 2020
- Figure 14: Technological Differences between SiC and GaN
- Figure 15: Competitive Benchmarking Matrix
- Figure 16: Wolfspeed, Inc.: R&D Expenditure, \$Million, 2018-2020
- Figure 17: Furukawa Co., Ltd.: R&D Expenditure, \$Million, 2018-2020
- Figure 18: IQE PLC: R&D Expenditure, \$Million, 2019 and 2020
- Figure 19: Infineon Technologies AG: R&D Expenditure, \$Billion, 2019 and 2020
- Figure 20: SOITEC: R&D Expenditure, \$Million, 2019 and 2020
- Figure 21: FUJITSU: R&D Expenditure, \$Billion, 2018-2020
- Figure 22: Qorvo, Inc.: R&D Expenditure, \$Million, 2019 and 2020
- Figure 23: Semiconductor Components Industries, LLC: R&D Expenditure, \$Million, 2019 and 2020
- Figure 24: Taiwan Semiconductor Manufacturing Company Limited: R&D Expenditure, \$Billion, 2019 and 2020
- Figure 25: Data Triangulation
- Figure 26: Bottom-Up Approach
- Figure 27: Top-Down Approach
- Figure 28: Assumptions and Limitations

List Of Tables

LIST OF TABLES

Table 1: Global Gallium Nitride Market (by Application), \$Million, 2021 and 2031

Table 2: Key Factors Determining “Threat of New Entrants” in the Global Gallium Nitride Market

Table 3: Key Factors Determining “Bargaining Power of Buyers” in the Global Gallium Nitride Market

Table 4: Key Factors Determining “Bargaining Power of Suppliers” in the Global Gallium Nitride Market

Table 5: Key Factors Determining “Threat of Substitutes” in the Global Gallium Nitride Market

Table 6: Key Factors Determining “Intensity of Competitive Rivalry” in the Global Gallium Nitride Market

Table 7: Impact Analysis of Market Drivers

Table 8: Impact Analysis of Market Restraints

Table 9: Impact Analysis of Market Opportunities

Table 10: Key Product Development, January 2018- October 2021

Table 11: Key Market Development, January 2018- October 2021

Table 12: Mergers and Acquisitions, Joint Ventures and Partnerships, and Collaborations (January 2018– October 2021)

Table 13: Global Gallium Nitride Market (by Application and Sub-Application), \$Million, 2020-2031

Table 14: Global Gallium Nitride Market (by Application), Thousand Cubic Centimeter, 2020 -2031

Table 15: Global Gallium Nitride Market (by Substrate Type), \$Million, 2020-2031

Table 16: Global Gallium Nitride Market (by Substrate Type), Thousand Cubic Centimeter, 2020-2031

Table 17: Physical Properties of Wide Bandgap Semiconductors

Table 18: North America Gallium Nitride Market (by Region), \$Million, 2020-2031

Table 19: North America Gallium Nitride Market (by Region), Thousand Cubic Centimeter, 2020-2031

Table 20: North America Gallium Nitride Market (by Application and Sub-Application), \$Million, 2020-2031

Table 21: North America Gallium Nitride Market (by Application and Sub-Application), Thousand Cubic Centimeter, 2020-2031

Table 22: North America Gallium Nitride Market (by Substrate Type), \$Million, 2020-2031

Table 23: North America Gallium Nitride Market (by Substrate Type), Thousand Cubic Centimeter, 2020-2031

Table 24: U.S. Gallium Nitride Market (by Application and Sub-Application), \$Million, 2020-2031

Table 25: U.S. Gallium Nitride Market (by Application and Sub-Application), Thousand Cubic Centimeter, 2020-2031

Table 26: U.S. Gallium Nitride Market (by Substrate Type), \$Million, 2020-2031

Table 27: U.S. Gallium Nitride Market (by Substrate Type), Thousand Cubic Centimeter, 2020-2031

Table 28: Canada Gallium Nitride Market (by Application and Sub-Application), \$Million, 2020-2031

Table 29: Canada Gallium Nitride Market (by Application and Sub-Application), Thousand Cubic Centimeter, 2020-2031

Table 30: Canada Gallium Nitride Market (by Substrate Type), \$Million, 2020-2031

Table 31: Canada Gallium Nitride Market (by Substrate Type), Thousand Cubic Centimeter, 2020-2031

Table 32: Mexico Gallium Nitride Market (by Application and Sub-Application), \$Million, 2020-2031

Table 33: Mexico Gallium Nitride Market (by Application and Sub-Application), Thousand Cubic Centimeter, 2020-2031

Table 34: Mexico Gallium Nitride Market (by Substrate Type), \$Million, 2020-2031

Table 35: Mexico Gallium Nitride Market (by Substrate Type), Thousand Cubic Centimeter, 2020-2031

Table 36: Europe Gallium Nitride Market (by Region), \$Million, 2020-2031

Table 37: Europe Gallium Nitride Market (by Region), Thousand Cubic Centimeter, 2020-2031

Table 38: Europe Gallium Nitride Market (by Application and Sub-Application), \$Million, 2020-2031

Table 39: Europe Gallium Nitride Market (by Application and Sub-Application), Thousand Cubic Centimeter, 2020-2031

Table 40: Europe Gallium Nitride Market (by Substrate Type), \$Million, 2020-2031

Table 41: Europe Gallium Nitride Market (by Substrate Type), Thousand Cubic Centimeter, 2020-2031

Table 42: Germany Gallium Nitride Market (by Application and Sub-Application), \$Million, 2020-2031

Table 43: Germany Gallium Nitride Market (by Application and Sub-Application), Thousand Cubic Centimeter, 2020-2031

Table 44: Germany Gallium Nitride Market (by Substrate Type), \$Million, 2020-2031

Table 45: Germany Gallium Nitride Market (by Substrate Type), Thousand Cubic

Centimeter, 2020-2031

Table 46: France Gallium Nitride Market (by Application and Sub-Application), \$Million, 2020-2031

Table 47: France Gallium Nitride Market (by Application and Sub-Application), Thousand Cubic Centimeter, 2020-2031

Table 48: France Gallium Nitride Market (by Substrate Type), \$Million, 2020-2031

Table 49: France Gallium Nitride Market (by Substrate Type), Thousand Cubic Centimeter, 2020-2031

Table 50: Netherlands Gallium Nitride Market (by Application and Sub-Application), \$Million, 2020-2031

Table 51: Netherlands Gallium Nitride Market (by Application and Sub-Application), Thousand Cubic Centimeter, 2020-2031

Table 52: Netherlands Gallium Nitride Market (by Substrate Type), \$Million, 2020-2031

Table 53: Netherlands Gallium Nitride Market (by Substrate Type), Thousand Cubic Centimeter, 2020-2031

Table 54: Rest-of-Europe Gallium Nitride Market (by Application and Sub-Application), \$Million, 2020-2031

Table 55: Rest-of-Europe Gallium Nitride Market (by Application and Sub-Application), Thousand Cubic Centimeter, 2020-2031

Table 56: Rest-of-Europe Gallium Nitride Market (by Substrate Type), \$Million, 2020-2031

Table 57: Rest-of-Europe Gallium Nitride Market (by Substrate Type), Thousand Cubic Centimeter, 2020-2031

Table 58: U.K. Gallium Nitride Market (by Region), \$Million, 2020-2031

Table 59: U.K. Gallium Nitride Market (by Region), Thousand Cubic Centimeter, 2020-2031

Table 60: U.K. Gallium Nitride Market (by Application and Sub-Application), \$Million, 2020-2031

Table 61: U.K. Gallium Nitride Market (by Application and Sub-Application), Thousand Cubic Centimeter, 2020-2031

Table 62: U.K. Gallium Nitride Market (by Substrate Type), \$Million, 2020-2031

Table 63: U.K. Gallium Nitride Market (by Substrate Type), Thousand Cubic Centimeter, 2020-2031

Table 64: China Gallium Nitride Market (by Region), \$Million, 2020-2031

Table 65: China Gallium Nitride Market (by Region), Thousand Cubic Centimeter, 2020-2031

Table 66: China Gallium Nitride Market (by Application and Sub-Application), \$Million, 2020-2031

Table 67: China Gallium Nitride Market (by Application and Sub-Application), Thousand

Cubic Centimeter, 2020-2031

Table 68: China Gallium Nitride Market (by Substrate Type), \$Million, 2020-2031

Table 69: China Gallium Nitride Market (by Substrate Type), Thousand Cubic Centimeter, 2020-2031

Table 70: Asia-Pacific and Japan Gallium Nitride Market (by Region), \$Million, 2020-2031

Table 71: Asia-Pacific and Japan Gallium Nitride Market (by Region), Thousand Cubic Centimeter, 2020-2031

Table 72: Asia-Pacific and Japan Gallium Nitride Market (by Application and Sub-Application), \$Million, 2020-2031

Table 73: Asia-Pacific and Japan Gallium Nitride Market (by Application and Sub-Application), Thousand Cubic Centimeter, 2020-2031

Table 74: Asia-Pacific and Japan Gallium Nitride Market (by Substrate Type), \$Million, 2020-2031

Table 75: Asia-Pacific and Japan Gallium Nitride Market (by Substrate Type), Thousand Cubic Centimeter, 2020-2031

Table 76: Japan Gallium Nitride Market (by Application and Sub-Application), \$Million, 2020-2031

Table 77: Japan Gallium Nitride Market (by Application and Sub-Application), Thousand Cubic Centimeter, 2020-2031

Table 78: Japan Gallium Nitride Market (by Substrate Type), \$Million, 2020-2031

Table 79: Japan Gallium Nitride Market (by Substrate Type), Thousand Cubic Centimeter, 2020-2031

Table 80: South Korea Gallium Nitride Market (by Application and Sub-Application), \$Million, 2020-2031

Table 81: South Korea Gallium Nitride Market (by Application and Sub-Application), Thousand Cubic Centimeter, 2020-2031

Table 82: South Korea Gallium Nitride Market (by Substrate Type), \$Million, 2020-2031

Table 83: South Korea Gallium Nitride Market (by Substrate Type), Thousand Cubic Centimeter, 2020-2031

Table 84: Taiwan Gallium Nitride Market (by Application and Sub-Application), \$Million, 2020-2031

Table 85: Taiwan Gallium Nitride Market (by Application and Sub-Application), Thousand Cubic Centimeter, 2020-2031

Table 86: Taiwan Gallium Nitride Market (by Substrate Type), \$Million, 2020-2031

Table 87: Taiwan Gallium Nitride Market (by Substrate Type), Thousand Cubic Centimeter, 2020-2031

Table 88: Rest-of-Asia-Pacific Gallium Nitride Market (by Application and Sub-Application), \$Million, 2020-2031

Table 89: Rest-of-Asia-Pacific Gallium Nitride Market (by Application and Sub-Application), Thousand Cubic Centimeter, 2020-2031

Table 90: Rest-of-Asia-Pacific Gallium Nitride Market (by Substrate Type), \$Million, 2020-2031

Table 91: Rest-of-Asia-Pacific Gallium Nitride Market (by Substrate Type), Thousand Cubic Centimeter, 2020-2031

Table 92: Rest-of-the-World Gallium Nitride Market (by Region), \$Million, 2020-2031

Table 93: Rest-of-the-World Gallium Nitride Market (by Region), Thousand Cubic Centimeter, 2020-2031

Table 94: Rest-of-the-World Gallium Nitride Market (by Application and Sub-Application), \$Million, 2020-2031

Table 95: Rest-of-the-World Gallium Nitride Market (by Application and Sub-Application), Thousand Cubic Centimeter, 2020-2031

Table 96: Rest-of-the-World Gallium Nitride Market (by Substrate Type), \$Million, 2020-2031

Table 97: Rest-of-the-World Gallium Nitride Market (by Substrate Type), Thousand Cubic Centimeter, 2020-2031

Table 98: South America Gallium Nitride Market (by Application and Sub-Application), \$Million, 2020-2031

Table 99: South America Gallium Nitride Market (by Application and Sub-Application), Thousand Cubic Centimeter, 2020-2031

Table 100: South America Gallium Nitride Market (by Substrate Type), \$Million, 2020-2031

Table 101: South America Gallium Nitride Market (by Substrate Type), Thousand Cubic Centimeter, 2020-2031

Table 102: Middle East and Africa Gallium Nitride Market (by Application and Sub-Application), \$Million, 2020-2031

Table 103: Middle East and Africa Gallium Nitride Market (by Application and Sub-Application), Thousand Cubic Centimeter, 2020-2031

Table 104: Middle East and Africa Gallium Nitride Market (by Substrate Type), \$Million, 2020-2031

Table 105: Middle East and Africa Gallium Nitride Market (by Substrate Type), Thousand Cubic Centimeter, 2020-2031

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