

# **Signal Generator Devices Market Forecasts to 2032 – Global Analysis By Type (RF Signal Generators, Microwave Signal Generators, Arbitrary Waveform Generators, Function Generators and Vector Signal Generators), Frequency Range, Technology, Application, End User and By Geography**

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## **Abstracts**

According to Statistics MRC, the Global Signal Generator Market is accounted for \$2.1 billion in 2025 and is expected to reach \$4.0 billion by 2032 growing at a CAGR of 9.2% during the forecast period. A signal generator is an electronic device that produces electrical signals with defined characteristics such as amplitude, frequency, and waveform shape. These signals—ranging from sine, square, triangular, or arbitrary waveforms—are used to simulate inputs for testing, calibrating, and troubleshooting electronic circuits and systems. Signal generators play a vital role in research, development, and maintenance across telecommunications, audio engineering, and RF applications. They can generate both analog and digital signals, often with modulation capabilities like AM, FM, or PM. Modern signal generators are microprocessor-controlled, offering precise adjustments and integration into automated test setups for enhanced accuracy and repeatability.

Market Dynamics:

Driver:

Telecom Expansion & 5G Rollout

The global surge in telecom infrastructure and accelerated 5G deployment is a key

growth catalyst for the signal generator market. As operators upgrade networks to support higher data rates and low-latency applications, demand for precise RF testing tools intensifies. Signal generators enable validation of complex modulation schemes and multi-band frequencies essential for 5G. Their integration into automated test environments ensures scalability and reliability, making them indispensable across R&D, manufacturing, and field testing in telecom ecosystems, thus it drives the market expansion.

Restraint:

#### High Cost of Advanced Equipment

Despite technological advancements, the high capital investment required for sophisticated signal generators remains a significant barrier. Premium models with wide frequency ranges, low phase noise, and advanced modulation capabilities often exceed budget constraints for small and mid-sized enterprises. Additionally, maintenance and calibration costs add to the total cost of ownership. This financial hurdle can delay procurement cycles and limit adoption in cost-sensitive sectors, particularly in emerging markets with constrained testing infrastructure.

Opportunity:

#### Advanced Testing & Calibration Needs

The growing complexity of electronic systems across aerospace, automotive, and IoT domains is driving demand for advanced testing and calibration solutions. Signal generators are pivotal in simulating real-world signal environments, enabling precise validation of components and systems. With increasing emphasis on reliability, safety, and compliance, industries are investing in high-performance generators that support arbitrary waveform generation, multi-channel outputs, and digital modulation. This trend opens lucrative opportunities for vendors offering scalable, software-defined test platforms.

Threat:

#### Complexity in Integration

Integration complexity poses a significant hindrance to the signal generator market by slowing deployment and increasing operational costs. Compatibility issues with legacy

systems, fragmented protocols, and steep learning curves for advanced configurations deter adoption, especially in resource-constrained environments. These challenges reduce efficiency in test setups and limit scalability across industries. Without streamlined interoperability and user-friendly interfaces, market growth risks being constrained by technical bottlenecks and prolonged implementation cycles.

### Covid-19 Impact

The COVID-19 pandemic initially disrupted supply chains and delayed capital expenditures in electronics testing. However, it also accelerated digital transformation and remote diagnostics, indirectly boosting demand for programmable signal generators. Industries prioritized resilient testing setups with remote control capabilities and cloud-based calibration. Post-pandemic recovery has seen renewed investment in telecom and defense sectors, where signal generators play a critical role in ensuring performance, compliance, and innovation continuity under evolving operational constraints.

The RF signal generators segment is expected to be the largest during the forecast period

The RF signal generators segment is expected to account for the largest market share during the forecast period, due to their critical role in wireless communication testing. With expanding applications in 5G, satellite systems, radar, and IoT, RF generators offer high-frequency precision, low phase noise, and versatile modulation formats. Their ability to simulate complex RF environments makes them essential for validating signal integrity, spectrum efficiency, and device interoperability. Continuous innovation in frequency agility and software control further reinforces their leadership across telecom and defense verticals.

The designing & testing segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the designing & testing segment is predicted to witness the highest growth rate, due to rising demand for robust validation tools in product development cycles. Signal generators are integral to prototyping, debugging, and performance benchmarking of electronic systems. As industries adopt agile development and rapid iteration models, the need for flexible, programmable signal sources grows. Enhanced waveform generation, multi-domain simulation, and integration with automated test suites position this segment as a strategic enabler of

innovation and quality assurance.

Region with largest share:

During the forecast period, the Asia Pacific region is expected to hold the largest market share due to rapid industrialization, telecom expansion, and electronics manufacturing hubs in China, Japan, South Korea, and India. Government initiatives supporting 5G, smart infrastructure, and semiconductor innovation are driving demand for advanced testing equipment. The region's strong presence of OEMs and R&D centers, coupled with rising investments in aerospace and automotive electronics, reinforces its dominant market position and long-term growth potential.

Region with highest CAGR:

Over the forecast period, the North America region is anticipated to exhibit the highest CAGR, owing to technological leadership in defense, aerospace, and next-gen wireless systems. The region's emphasis on precision testing, regulatory compliance, and innovation in mmWave and quantum technologies drives adoption of high-performance signal generators. Strategic investments in 6G research, autonomous systems, and cybersecurity testing further amplify growth. Robust infrastructure, skilled workforce, and strong vendor presence position North America as a dynamic growth engine for advanced signal generation solutions.

Key players in the market

Some of the key players profiled in the Signal Generator Market include Rohde & Schwarz, Tektronix, Anritsu, National Instruments (NI), Tabor Electronics, Siglent Technologies, RIGOL Technologies, GW Instek, Chroma ATE, Viavi Solutions, Aaronia AG, Aim-TTi, B&K Precision, Stanford Research Systems and Keysight Technologies.

Key Developments:

In January 2025, Anritsu partnered with Synopsys and Tektronix to showcase PCIe 6.0/7.0 signal integrity solutions, including live demonstrations of PAM4 signal testing and PHY IP verification.

In November 2024, Tektronix unveils its TICP IsoVu™ RF-isolated current probes and EA-PSB 20000 Triple bidirectional power supply—tools that raze the boundaries between safety and precision, forging a compact, high-density future for engineers

charging ahead in electrification's relentless symphony.

Types Covered:

RF Signal Generators

Microwave Signal Generators

Arbitrary Waveform Generators

Function Generators

Vector Signal Generators

Frequency Ranges Covered:

1 GHz – 6 GHz

6 GHz – 20 GHz

Above 20 GHz

Distribution Channels Covered:

Direct Sales

Distributors & Resellers

Online Sales

Technologies Covered:

Analog Signal Generators

Digital Signal Generators

**Applications Covered:**

Designing & Testing

Manufacturing

Troubleshooting

Repair & Maintenance

Research & Development

Other Applications

**End Users Covered:**

Telecommunications

Electronics Manufacturing

Aerospace & Defense

Automotive

Education & Research Institutes

Healthcare & Medical Devices

Industrial Sector

Other End Users

**Regions Covered:**

North America

US

Canada

Mexico

Europe

Germany

UK

Italy

France

Spain

Rest of Europe

Asia Pacific

Japan

China

India

Australia

New Zealand

South Korea

Rest of Asia Pacific

South America

Argentina

Brazil

Chile

Rest of South America

Middle East & Africa

Saudi Arabia

UAE

Qatar

South Africa

Rest of Middle East & Africa

What our report offers:

- Market share assessments for the regional and country-level segments
- Strategic recommendations for the new entrants
- Covers Market data for the years 2024, 2025, 2026, 2028, and 2032
- Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)
- Strategic recommendations in key business segments based on the market estimations
- Competitive landscaping mapping the key common trends
- Company profiling with detailed strategies, financials, and recent developments
- Supply chain trends mapping the latest technological advancements

### **Free Customization Offerings:**

All the customers of this report will be entitled to receive one of the following free customization options:

Company Profiling

Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)

Competitive Benchmarking

Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

## 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 Technology Analysis
- 3.7 Application Analysis
- 3.8 End User Analysis
- 3.9 Emerging Markets
- 3.10 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 SIGNAL GENERATOR MARKET, BY TYPE**

- 5.1 Introduction
- 5.2 RF Signal Generators
- 5.3 Microwave Signal Generators
- 5.4 Arbitrary Waveform Generators
- 5.5 Function Generators
- 5.6 Vector Signal Generators

## **6 GLOBAL SIGNAL GENERATOR MARKET, BY FREQUENCY RANGE**

- 6.1 Introduction
- 6.2 1 GHz – 6 GHz
- 6.3 6 GHz – 20 GHz
- 6.4 Above 20 GHz

## **7 GLOBAL SIGNAL GENERATOR MARKET, BY DISTRIBUTION CHANNEL**

- 7.1 Introduction
- 7.2 Direct Sales
- 7.3 Distributors & Resellers
- 7.4 Online Sales

## **8 GLOBAL SIGNAL GENERATOR MARKET, BY TECHNOLOGY**

- 8.1 Introduction
- 8.2 Analog Signal Generators
- 8.3 Digital Signal Generators

## **9 GLOBAL SIGNAL GENERATOR MARKET, BY APPLICATION**

- 9.1 Introduction
- 9.2 Designing & Testing
- 9.3 Manufacturing
- 9.4 Troubleshooting
- 9.5 Repair & Maintenance
- 9.6 Research & Development
- 9.7 Other Applications

## **10 GLOBAL SIGNAL GENERATOR MARKET, BY END USER**

- 10.1 Introduction
- 10.2 Telecommunications
- 10.3 Electronics Manufacturing
- 10.4 Aerospace & Defense
- 10.5 Automotive
- 10.6 Education & Research Institutes
- 10.7 Healthcare & Medical Devices
- 10.8 Industrial Sector
- 10.9 Other End Users

## **11 GLOBAL SIGNAL GENERATOR MARKET, BY GEOGRAPHY**

- 11.1 Introduction
- 11.2 North America
  - 11.2.1 US
  - 11.2.2 Canada
  - 11.2.3 Mexico
- 11.3 Europe
  - 11.3.1 Germany
  - 11.3.2 UK
  - 11.3.3 Italy
  - 11.3.4 France
  - 11.3.5 Spain
  - 11.3.6 Rest of Europe
- 11.4 Asia Pacific
  - 11.4.1 Japan
  - 11.4.2 China
  - 11.4.3 India
  - 11.4.4 Australia
  - 11.4.5 New Zealand
  - 11.4.6 South Korea
  - 11.4.7 Rest of Asia Pacific
- 11.5 South America
  - 11.5.1 Argentina
  - 11.5.2 Brazil
  - 11.5.3 Chile

- 11.5.4 Rest of South America
- 11.6 Middle East & Africa
  - 11.6.1 Saudi Arabia
  - 11.6.2 UAE
  - 11.6.3 Qatar
  - 11.6.4 South Africa
  - 11.6.5 Rest of Middle East & Africa

## **12 KEY DEVELOPMENTS**

- 12.1 Agreements, Partnerships, Collaborations and Joint Ventures
- 12.2 Acquisitions & Mergers
- 12.3 New Product Launch
- 12.4 Expansions
- 12.5 Other Key Strategies

## **13 COMPANY PROFILING**

- 13.1 Rohde & Schwarz
- 13.2 Tektronix
- 13.3 Anritsu
- 13.4 National Instruments (NI)
- 13.5 Tabor Electronics
- 13.6 Siglent Technologies
- 13.7 RIGOL Technologies
- 13.8 GW Instek
- 13.9 Chroma ATE
- 13.10 Viavi Solutions
- 13.11 Aaronia AG
- 13.12 Aim-TTi
- 13.13 B&K Precision
- 13.14 Stanford Research Systems
- 13.15 Keysight Technologies

## List Of Tables

### LIST OF TABLES

- Table 1 Global Signal Generator Market Outlook, By Region (2024-2032) (\$MN)
- Table 2 Global Signal Generator Market Outlook, By Type (2024-2032) (\$MN)
- Table 3 Global Signal Generator Market Outlook, By RF Signal Generators (2024-2032) (\$MN)
- Table 4 Global Signal Generator Market Outlook, By Microwave Signal Generators (2024-2032) (\$MN)
- Table 5 Global Signal Generator Market Outlook, By Arbitrary Waveform Generators (2024-2032) (\$MN)
- Table 6 Global Signal Generator Market Outlook, By Function Generators (2024-2032) (\$MN)
- Table 7 Global Signal Generator Market Outlook, By Vector Signal Generators (2024-2032) (\$MN)
- Table 8 Global Signal Generator Market Outlook, By Frequency Range (2024-2032) (\$MN)
- Table 9 Global Signal Generator Market Outlook, By 1 GHz – 6 GHz (2024-2032) (\$MN)
- Table 10 Global Signal Generator Market Outlook, By 6 GHz – 20 GHz (2024-2032) (\$MN)
- Table 11 Global Signal Generator Market Outlook, By Above 20 GHz (2024-2032) (\$MN)
- Table 12 Global Signal Generator Market Outlook, By Distribution Channel (2024-2032) (\$MN)
- Table 13 Global Signal Generator Market Outlook, By Direct Sales (2024-2032) (\$MN)
- Table 14 Global Signal Generator Market Outlook, By Distributors & Resellers (2024-2032) (\$MN)
- Table 15 Global Signal Generator Market Outlook, By Online Sales (2024-2032) (\$MN)
- Table 16 Global Signal Generator Market Outlook, By Technology (2024-2032) (\$MN)
- Table 17 Global Signal Generator Market Outlook, By Analog Signal Generators (2024-2032) (\$MN)
- Table 18 Global Signal Generator Market Outlook, By Digital Signal Generators (2024-2032) (\$MN)
- Table 19 Global Signal Generator Market Outlook, By Application (2024-2032) (\$MN)
- Table 20 Global Signal Generator Market Outlook, By Designing & Testing (2024-2032) (\$MN)
- Table 21 Global Signal Generator Market Outlook, By Manufacturing (2024-2032) (\$MN)

Table 22 Global Signal Generator Market Outlook, By Troubleshooting (2024-2032) (\$MN)

Table 23 Global Signal Generator Market Outlook, By Repair & Maintenance (2024-2032) (\$MN)

Table 24 Global Signal Generator Market Outlook, By Research & Development (2024-2032) (\$MN)

Table 25 Global Signal Generator Market Outlook, By Other Applications (2024-2032) (\$MN)

Table 26 Global Signal Generator Market Outlook, By End User (2024-2032) (\$MN)

Table 27 Global Signal Generator Market Outlook, By Telecommunications (2024-2032) (\$MN)

Table 28 Global Signal Generator Market Outlook, By Electronics Manufacturing (2024-2032) (\$MN)

Table 29 Global Signal Generator Market Outlook, By Aerospace & Defense (2024-2032) (\$MN)

Table 30 Global Signal Generator Market Outlook, By Automotive (2024-2032) (\$MN)

Table 31 Global Signal Generator Market Outlook, By Education & Research Institutes (2024-2032) (\$MN)

Table 32 Global Signal Generator Market Outlook, By Healthcare & Medical Devices (2024-2032) (\$MN)

Table 33 Global Signal Generator Market Outlook, By Industrial Sector (2024-2032) (\$MN)

Table 34 Global Signal Generator Market Outlook, By Other End Users (2024-2032) (\$MN)

Note: Tables for North America, Europe, APAC, South America, and Middle East & Africa Regions are also represented in the same manner as above.

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