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Microwave Devices Market ? Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Type (Active Microwave Devices & Passive Microwave Devices), By Frequency (L-Band, S-Band, C-Band, X-Band, Ku-Band and Ka-Band), By Application (Space & Communication, Medical, Defense and Commercial), By Region & Competition, 2021-2031F

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Abstracts

The Global Microwave Devices Market is projected to expand from USD 8.68 Billion in 2025 to USD 12.39 Billion by 2031, registering a CAGR of 6.11%. This sector encompasses the engineering and production of hardware components designed to generate, amplify, detect, or manage electromagnetic radiation within the frequency band of 300 MHz to 300 GHz. Growth is primarily driven by the critical requirements of national defense systems, including radar and electronic warfare, alongside the increasing demand for high-capacity telecommunications infrastructure needed for modern data transmission. These essential needs fuel a steady demand for components such as magnetrons, klystrons, and solid-state amplifiers, anchoring market stability in functional utility rather than fleeting technological trends.

However, the market confronts significant obstacles due to the high manufacturing costs and technical complexities associated with the compound semiconductors required for high-frequency performance. These economic hurdles frequently restrict widespread adoption in price-sensitive commercial sectors and can cause supply chain bottlenecks. Demonstrating the substantial scale of the component industry despite these challenges, the Semiconductor Industry Association reported that global semiconductor

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sales reached $627.6 billion in 2024. This figure underscores the immense financial investment in the electronic supply chain, which is fundamental to supporting the production and deployment of these microwave technologies.

Market Driver

Rising global defense expenditure acts as a significant market catalyst as nations prioritize advanced radar and electronic warfare systems to counter geopolitical instability. Modern military operations demand specialized microwave components, such as traveling wave tubes and gallium nitride amplifiers, to guarantee superior signal detection and jamming capabilities. This increase in procurement is supported by substantial capital allocation; according to the Stockholm International Peace Research Institute (SIPRI) April 2024 'Trends in World Military Expenditure, 2023' Fact Sheet, global military spending hit a record high of $2443 billion in 2023. This budgetary growth directly drives the acquisition of hardware essential for secure communications and surveillance, thereby sustaining the industrial base for high-frequency electronics.

Concurrently, the rapid deployment of 5G networks and next-generation telecommunication infrastructure generates a critical need for microwave backhaul and massive MIMO antenna arrays. As network densification increases to manage data traffic, operators must install numerous small cells and macro base stations, all utilizing microwave devices for signal transmission and management. To illustrate the scale of this adoption, the June 2024 'Ericsson Mobility Report' notes that global 5G subscriptions grew by 160 million in the first quarter of 2024, reaching a total of 1.7 billion. This user growth necessitates continuous infrastructure upgrades, reinforced by the GSMA's projection that mobile operators will invest $1.5 trillion in their networks between 2023 and 2030, securing long-term revenue for component manufacturers.

Market Challenge

The substantial manufacturing costs and technical intricacies associated with compound semiconductors represent a formidable barrier to the Global Microwave Devices Market. Unlike standard silicon components, the materials required for high-frequency performance necessitate complex fabrication processes and specialized production environments. These requirements significantly inflate the capital expenditure needed for market entry and expansion, thereby raising the unit cost of final devices. Consequently, this economic hurdle creates a bottleneck that hinders widespread adoption in commercial sectors operating on tight profit margins, restricting the technology primarily to well-funded defense and infrastructure applications.

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The impact of these costs is evident in the massive financial scale required to sustain the supply chain, which limits the number of capable manufacturers and suppresses competitive pricing. The acquisition and maintenance of precision manufacturing tools establish a rigid financial threshold for industry participants. Illustrating this capital intensity, SEMI reported in December 2024 that global semiconductor equipment billings reached $30.38 billion for the third quarter of 2024. This magnitude of spending highlights the immense investment required to maintain production capabilities, which directly constrains the market's potential for rapid commercial expansion.

Market Trends

The widespread adoption of Gallium Nitride (GaN) technology is fundamentally reshaping the market by replacing legacy silicon LDMOS and traveling wave tubes in high-power applications. This transition is driven by GaN?s superior breakdown voltage and electron mobility, which enable smaller, more efficient, and higher-power density devices essential for next-generation radar and satellite uplinks. The shift is particularly aggressive in the defense sector, where size, weight, and power (SWaP) constraints are critical. According to MACOM Technology Solutions Holdings, Inc.'s November 2025 earnings call, the company reported that its GaN-based components within defense, radar, and electronic warfare markets saw over 50% year-over-year revenue growth, underscoring the rapid industrial conversion to this advanced material.

Simultaneously, the migration to higher frequency millimeter-wave (mmWave) bands is accelerating as operators seek uncongested spectrum to deliver ultra-high capacity and low-latency connectivity. This trend extends beyond traditional microwave frequencies into the 24 GHz to 100 GHz range, requiring new hardware architectures for backhaul and fixed wireless access (FWA) deployments. While this move enables fiber-like wireless speeds, it necessitates denser deployment of specialized user equipment and customer premise equipment (CPE) to overcome propagation challenges. According to the Global mobile Suppliers Association's September 2025 survey, shipments of mmWave-capable 5G CPE reached 739,000 units in 2024, highlighting the tangible hardware ramp-up supporting this high-frequency ecosystem.

Key Market Players

L3Harris Technologies

Thales Group

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Teledyne Technologies

CPI International

Qorvo

Analog Devices

Richardson Electronics

Toshiba Corporation

Keysight Technologies

MACOM Technology

Report Scope

In this report, the Global Microwave Devices Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Microwave Devices Market, By Type

Active Microwave Devices & Passive Microwave Devices

Microwave Devices Market, By Frequency

L-Band

S-Band

C-Band

X-Band

Ku-Band and Ka-Band

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South Korea

South America

Brazil

Argentina

Colombia

Middle East & Africa

South Africa

Saudi Arabia

UAE

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global Microwave Devices Market.

Available Customizations:

Global Microwave Devices Market report with the given market data, TechSci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

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