

Millimeter Wave Technology Market: Global Industry Trends, Share, Size, Growth, Opportunity and Forecast 2023-2028

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Abstracts

The global millimeter wave technology market size reached US\$ 2.1 Billion in 2022. Looking forward, IMARC Group expects the market to reach US\$ 6.8 Billion by 2028, exhibiting a growth rate (CAGR) of 21.6% during 2022-2028. The global millimeter wave technology market is experiencing significant growth driven by the increasing demand for high-speed data transfer, the adoption of 5G technology, and the need for advanced imaging and scanning solutions.

Millimeter wave technology, also referred to as extremely high frequency (EHF) technology, involves the transmission of data through radio waves with wavelengths that fall in the range between 1mm and 10mm, or equivalently, frequencies between 30GHz and 300GHz. It utilizes short wavelengths, enabling high-speed data transmission and enhanced communication performance. With its large bandwidth and high-frequency spectrum, millimeter wave technology facilitates faster internet speeds, enabling the seamless transfer of massive data volumes. Moreover, it supports the development of advanced wireless communication systems, such as 5G networks, which provide low latency and high-capacity connectivity. The advantages of millimeter wave technology also extend to applications like autonomous vehicles, augmented reality, and smart city infrastructure. Furthermore, this technology comes in two types: passive and active. Passive millimeter wave systems detect naturally occurring radiation, while active systems employ a transmitter and receiver to generate and receive millimeter wave signals.

The global millimeter wave technology market is bolstered by a multitude of factors, including the growing demand for high-speed data transfer and the increasing adoption of 5G technology. Additionally, the rising need for high-resolution imaging and scanning technologies in various industries, including healthcare, aerospace, and defense, is boosting the demand for millimeter wave technology. Furthermore, the proliferation of

the Internet of Things (IoT) devices and the need for seamless connectivity are fueling the market growth. Moreover, the increasing deployment of millimeter wave technology in backhaul networks to support the growing data traffic is another significant driver. The surging awareness regarding the technology's ability to provide efficient and cost-effective wireless backhaul solutions and the advancements in semiconductor and communication technologies are favoring the market growth.

Millimeter Wave Technology Market Trends/Drivers:

Growing demand for high-speed data transfer and the increasing adoption of 5G

As the demand for faster data transmission rates rises, millimeter wave spectrum offers the advantage of higher bandwidth, making it an ideal solution for applications like autonomous vehicles, virtual reality, and high-definition video streaming. The need for seamless connectivity and the proliferation of IoT devices further fuel the demand for millimeter wave technology, enabling efficient and reliable communication between devices. With 5G deployment gaining momentum worldwide, the market for millimeter wave technology is set to experience substantial growth.

Rising need for high-resolution imaging and scanning technologies in various industries

The surging demand for high-resolution imaging and scanning technologies in various industries, including healthcare, aerospace, and defense, is a significant driver for the global millimeter wave technology market. Millimeter wave technology enables precise and detailed imaging, making it valuable for medical diagnostic tools, security screening devices, and aerospace applications. The ability to capture high-quality images and provide accurate scanning capabilities in real-time is crucial for enhancing safety, security, and operational efficiency in these industries. Consequently, the demand for millimeter wave technology is increasing as organizations seek advanced imaging and scanning solutions for various critical applications.

Increasing deployment of millimeter wave technology in backhaul networks

The increasing deployment of millimeter wave technology in backhaul networks to support the growing data traffic is a significant driver for the global market. With the exponential growth in data consumption and the demand for higher data speeds, traditional wireless networks face challenges in meeting these requirements. Millimeter wave technology offers a viable solution by providing high-bandwidth wireless backhaul connections, enabling efficient data transfer between base stations and core networks. Telecom operators worldwide are adopting millimeter wave technology to address the capacity and performance needs of their networks, paving the way for substantial market growth.

Millimeter Wave Technology Industry Segmentation:

IMARC Group provides an analysis of the key trends in each segment of the global millimeter wave technology market report, along with forecasts at the global, regional and country levels from 2023-2028. Our report has categorized the market based on

component, product, frequency band, license type and application.

Breakup by Component:

Antennas and Transceivers

Amplifiers

Oscillators

Control Devices

Frequency Converters

Passive Components

Others

Antennas and transceivers dominate the market

The report has provided a detailed breakup and analysis of the market based on the component. This includes antennas and transceivers, amplifiers, oscillators, control devices, frequency converters, passive components, and others. According to the report, antennas and transceivers represented the largest segment.

Antennas and transceivers play a crucial role in millimeter wave technology, and their market dominance can be attributed to several factors. With the escalating demand for high-speed data transmission, there's a burgeoning need for antennas and transceivers capable of operating in the high frequency, high data rate millimeter wave spectrum. They are fundamental in enabling 5G networks, which promise superior speed and lower latency. Transceivers facilitate the conversion of these high frequency signals into a format usable by electronic devices, while antennas are essential for signal transmission and reception over these higher frequencies. Furthermore, millimeter wave technology requires a dense network of antennas due to its shorter range and susceptibility to interference, increasing the demand for these components. In other applications, such as security scanning, radar systems, and remote sensing, high-resolution capabilities offered by millimeter wave technology are also driving the need for specialized antennas and transceivers, thereby leading the market.

Breakup by Product:

Telecommunication Equipment

Imaging and Scanning Systems

Radar and Satellite Communication Systems

Services

Telecommunication equipment hold the largest share in the market

A detailed breakup and analysis of the market based on the product has also been provided in the report. This includes telecommunication equipment, imaging and scanning systems, radar and satellite communication systems, and services. According to the report, telecommunication equipment accounted for the largest market share.

Telecommunication equipment is leading the millimeter wave technology market due to the surging demand for high-speed, high-capacity wireless communication. The

transition to 5G networks heavily relies on millimeter wave technology to deliver unprecedented speed and lower latency, boosting the need for compatible telecommunication equipment. Millimeter wave technology allows for significantly higher data rates and more simultaneous connections compared to previous generations of mobile networks. This is particularly critical for supporting the growth of IoT, streaming services, virtual and augmented reality, and other data-intensive applications. Moreover, the smaller wavelength of millimeter waves enables more compact antenna design and the deployment of massive MIMO (multiple-input, multiple-output) technology, which uses multiple antennas to improve communication performance.

Breakup by Frequency Band:

30 GHz - 57 GHz

57 GHz - 96 GHz

96 GHz -300 GHz

57 GHz - 96 GHz dominate the market

The report has provided a detailed breakup and analysis of the market based on the frequency band. This includes 30 GHz - 57 GHz, 57 GHz - 96 GHz, and 96 GHz -300 GHz. According to the report, 57 GHz - 96 GHz represented the largest segment.

The frequency band between 57 GHz and 96 GHz is leading the millimeter wave technology market due to several key factors. This range, also known as the E-band, offers abundant unlicensed or lightly licensed spectrum, providing a cost-effective solution for wireless communication services. Additionally, the higher frequencies allow for more bandwidth, which translates into faster data rates and higher capacity, critical for high-speed applications such as 5G networks and high-performance computing. These frequencies are particularly beneficial for supporting data-intensive applications like video streaming, virtual reality, and IoT devices. Moreover, these frequencies allow for smaller antenna sizes, leading to more compact and dense network infrastructure, essential for urban areas and indoor usage. Lastly, the signal's shorter range in this frequency band enhances security as it's harder to intercept.

Breakup by License Type:

Light Licensed Frequency Millimeter Wave

Unlicensed Frequency Millimeter Wave

Fully Licensed Frequency Millimeter Wave

Fully licensed frequency millimeter wave hold the largest share in the market

A detailed breakup and analysis of the market based on the license type has also been provided in the report. This includes light licensed, unlicensed, and fully licensed frequency millimeter wave. According to the report, fully licensed frequency millimeter wave accounted for the largest market share.

Fully licensed frequency millimeter wave involves the allocation of specific frequency bands within the millimeter wave spectrum through an official licensing process. This

approach ensures exclusive access to the allocated spectrum, providing a high degree of control and protection against interference. Fully licensed frequency millimeter wave is often utilized by telecommunications operators for deploying 5G networks and other mission-critical applications. It allows for efficient spectrum management, ensures quality of service, and enables seamless integration with existing cellular infrastructure.

Breakup by Application:

Telecommunication

Military and Defense

Automotive and Transport

Healthcare

Electronics and Semiconductor

Others

Telecommunication dominates the market

The report has provided a detailed breakup and analysis of the market based on the application. This includes telecommunication, military and defense, automotive and transport, healthcare, electronics and semiconductor, and others. According to the report, telecommunication represented the largest segment.

Telecommunication is the largest application of millimeter wave technology due to the escalating demand for high-speed, high-capacity data transmission. Millimeter waves, with their high frequencies, enable faster data rates and higher bandwidth, making them ideal for wireless communication services. The advent of 5G networks, which extensively utilizes millimeter wave frequencies, further accentuates this demand. The shorter wavelengths of millimeter waves also allow the use of smaller antennas, enabling dense, urban deployments and massive MIMO configurations, enhancing network capacity and performance. Moreover, millimeter wave technology can alleviate congestion in lower frequency bands, providing a solution for the growing number of wireless devices and data-intensive applications like video streaming, IoT, and augmented or virtual reality. Despite challenges such as shorter range and susceptibility to environmental interference, the benefits of millimeter wave technology in improving telecommunication services continue to fuel its application in this sector.

Breakup by Region:

North America

United States

Canada

Asia Pacific

China

Japan

India

South Korea

Australia
Indonesia
Others
Europe
Germany
France
United Kingdom
Italy
Spain
Russia
Others
Latin America
Brazil
Mexico
Others
Middle East and Africa

North America exhibits a clear dominance, accounting for the largest millimeter wave technology market share

The report has also provided a comprehensive analysis of all the major regional markets, which include North America (the United States and Canada); Europe (Germany, France, the United Kingdom, Italy, Spain, Russia, and Others); Asia Pacific (China, Japan, India, South Korea, Australia, Indonesia, and Others); Latin America (Brazil, Mexico, and Others); and the Middle East and Africa. According to the report, North America accounted for the largest market share.

North America is leading the millimeter wave technology market due to a combination of technological advancements, early adoption, and regulatory support. The region is home to several tech giants and telecommunication companies that are at the forefront of researching and implementing new technologies, including 5G, which relies heavily on millimeter wave technology. Furthermore, the Federal Communications Commission (FCC) in the United States has made significant amounts of millimeter wave spectrum available for licensed and unlicensed use, fostering innovation and deployment in this space. The presence of a robust infrastructure for developing and deploying advanced telecommunications services, combined with a strong emphasis on IoT and smart city initiatives, also contributes to North America's dominance in the millimeter wave technology market.

Competitive Landscape:

The global millimeter wave technology market is highly competitive, with several key players competing for market share. These players focus on research and development activities to enhance the capabilities of millimeter wave technology and introduce

innovative products. The market is characterized by strategic partnerships, collaborations, and acquisitions, as companies aim to strengthen their market position and expand their product portfolios. Additionally, players strive to establish strong distribution networks and engage in marketing activities to increase their customer base. As the market grows, competition intensifies, driving companies to differentiate themselves through technological advancements, quality, pricing strategies, and customer service. The competitive landscape is dynamic, with players constantly seeking opportunities in emerging regions and industry verticals.

The report has provided a comprehensive analysis of the competitive landscape in the market. Detailed profiles of all major companies have also been provided. Some of the key players in the market include:

Aviat Networks Inc.

AXXCSS Wireless Solutions Inc.

Farran Technology Ltd.

Fastback Networks Inc.

Keysight Technologies Inc.

L3 Technologies Inc.

Millimeter Wave Products Inc.

Mistral Solutions Pvt. Ltd. (AXISCADES Engineering Technologies Ltd.)

NEC Corporation

Siklu Communication Ltd.

Smiths Group Plc

Vubiq Networks Inc.

Recent Developments:

In July 2023, NEC Corporation developed generative artificial intelligence (AI) that is customizable for each customer in order to create new value for companies in response to business changes caused by new technologies.

In June 2023, Aviat Networks, Inc. announced a new 11 GHz indoor microwave radio with the highest transmitter power ever supported in the industry, to allow more capacity, longer links and provide operators with an alternative to deploy long distance links without the potential risk of interference in the 6 GHz band.

In June 2023, The U.S. Space Force Space Systems Command awarded L3Harris Technologies approximately \$29 million for a sensor payload design contract to deliver a digital model for the medium Earth orbit (MEO) – Missile Track Custody (MTC) Epoch 1 program that will support detecting and tracking hypersonic missiles.

Key Questions Answered in This Report

1. What was the size of the global millimeter wave technology market in 2022?
2. What is the expected growth rate of the global millimeter wave technology market during 2023-2028?

3. What has been the impact of COVID-19 on the global millimeter wave technology market?
4. What are the key factors driving the global millimeter wave technology market?
5. What is the breakup of the global millimeter wave technology market based on the component?
6. What is the breakup of the global millimeter wave technology market based on the product?
7. What is the breakup of the global millimeter wave technology market based on the frequency band?
8. What is the breakup of the global millimeter wave technology market based on the license type?
9. What is the breakup of the global millimeter wave technology market based on the application?
10. What are the key regions in the global millimeter wave technology market?
11. Who are the key players/companies in the global millimeter wave technology market?

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