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# Millimeter Wave Technology Market by Product (Scanning Systems, Telecommunication Equipment), License Type (Unlicensed, Fully Licensed), Application (Mobile & Telecommunication, Automotive), Component, Frequency Band and Region - Global Forecast to 2028

https://marketpublishers.com/r/M391710760DEN.html
Date: May 2023
Pages: 292
Price: US$ 4,950.00 (Single User License)
ID: M391710760DEN

## Abstracts

The millimeter wave technology market is projected to reach from USD 2.8 billion in 2023 to USD 7.9 billion by 2028, at a CAGR of 22.8%. Some key factors accrediting to the growth of millimeter wave technology market include increase in broadband and mobile speeds, rising use of millimeter wave in small-cell backhaul networks, and surging demand for millimeter wave technology in security and radar applications.

The recession’s impact on the millimeter wave technology market has been analyzed in this study. The short-term outlook for semiconductors and materials revenues is expected to be worse in the third quarter of 2023. Rising inflation, increasing interest rates, unemployment, and energy crises will lead to slow economic activity. As a result, end-user industries experience deterioration of their businesses, cash flow, and ability to obtain financing, delaying or canceling product purchase plans.

Communication and networking components market to hold a significant share of the millimeter wave technology market during the forecast period

Communication and networking components include switches and routers, which are crucial in telecommunication applications. The quest for a viable and low-cost solution for high data rate applications such as home and personal area networking, automotive radar, and high bandwidth communications has helped boost the millimeter wave

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technology market. During the last five years, market players have been increasingly focusing on the semiconductor segment due to the advantages of millimeter wave technology. Communication and networking are key components in any millimeter wave device, especially for the telecom sector, a major application sector for millimeter wave technology.

Unlicensed type to hold the second largest share of millimeter wave technology market during the forecast period

License-free 60 GHz radios have unique characteristics that significantly differ from the traditional 2.4 GHz to 5 GHz license-free radios and licensed millimeter wave radios. The FCC allocated 7 GHz of unchanneled spectrum for license-free operations between 57 and 64 GHz. The allocation has made multi-gigabit radio frequency links possible. In the US, the FCC has set aside the V band (60 GHz) as an unlicensed spectrum. This band provides 14 GHz of contiguous spectrum available for anybody to use. In June 2019, Siklu launched its third-generation gigabit wireless solution in the MultiHaul product line that would integrate Facebook’s Terragraph within its products.

Aerospace & defense to hold the second largest share of millimeter wave technology market during the forecast period

As millimeter waves are superior to microwave and infrared-based sensors in almost every application, they are extensively used in defense and aerospace applications as well as solutions that test, filter, and process high-frequency signals for wireless telecommunication networks. Millimeter waves are also used to provide antenna systems for use in military and commercial aerospace applications and a wide range of innovative RF and microwave solutions for the wireless telecommunication devices used in the aerospace and defense sector. In May 2021, Pasternack, an Infinite Electronics brand leading provider of RF, microwave, and millimeter wave products, launched a new series of low-noise amplifiers perfect for use in aerospace and defense applications, mainly for electronic warfare, space systems, and R&D.

Europe to hold a significant share of the millimeter wave technology market during the forecast period

Europe is an important market for millimeter wave technology owing to its increased use in various sectors. Europe has been the frontrunner in 5G trials and projects that are currently being implemented in various regions of the world. Various industries are providing 5G services across Europe, including enhanced mobile broadband, massive

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machine-type communications, and ultra-reliable and low-latency communications. Such commercial 5G launches require substantial investments for the new infrastructure, a large amount of spectrum, new capabilities, and a close collaboration between telecom players, network enablers, and government authorities.

In the process of determining and verifying the market size for several segments and subsegments gathered through secondary research, extensive primary interviews have been conducted with key industry experts in the millimeter wave technology market space. The break-up of primary participants for the report has been shown below:

By Company Type: Tier 1 – 45%, Tier 2 – 34%, and Tier 3 – 21%

By Designation: C-level Executives – 45%, Directors – 36%, and Others – 19%

By Region: North America –39%, Asia Pacific –41%, Europe – 16%, and RoW – 4%

The report profiles key players in the millimeter wave technology market with their respective market ranking analysis. Prominent players profiled in this report are Axxcss Wireless Solutions, Inc. (US), NEC Corporation (Japan), Siklu Communication (US), L3HARRIS Technologies, Inc. (US) , Smiths Group PLC (UK), Millimeter Wave Products Inc. (US), Farran Technology (Ireland), Eravant (US), Keysight Technologies, Inc. (US), and Avait Networks, Inc. (US), among others.

Research Coverage:

This research report categorizes the millimeter wave technology market on the basis of product, component, license type, frequency band, end use, and region. The report describes the major drivers, restraints, challenges, and opportunities pertaining to the millimeter wave technology market and forecasts the same till 2028 (including analysis of recession impact on the market). Apart from these, the report also consists of leadership mapping and analysis of all the companies included in the millimeter wave technology ecosystem.

Key Benefits of Buying the Report

The report would help leaders/new entrants in this market in the following ways:

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1. This report segments the millimeter wave technology market comprehensively and provides the closest market size projection for all subsegments across different regions.
2. The report helps stakeholders understand the pulse of the market and provides them with information on key drivers, restraints, challenges, and opportunities for market growth.
3. This report would help stakeholders understand their competitors better and gain more insights to improve their position in the business. The competitive landscape section includes competitor ecosystem, product developments and launches, partnerships, and mergers and acquisitions.
4. The analysis of the major 25 companies, based on the strength of the market rank as well as the product footprint will help stakeholders visualize the market positioning of these key players.
5. Patent analysis, trade data, porters five forces analysis, and technological analysis that will shape the market in the coming years has also been covered in this report.

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# Contents

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**15 COMPANY PROFILES**

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*Details on Business Overview, Products/Solutions/Services Offered, Recent Developments, MnM view (Key strengths/Right to win, Strategic choices made, Weakness/competitive threats)* might not be captured in case of unlisted companies.

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# About

The MM wave industry value chain is closely interlaced to the value chain of microwave and traditional RF chipset. From last couple of years MM wave value chain is been rapidly evolving into strong, well interlinked value chain. Several new technologies and standards, frequency allocations, product developments, new business models have come up owing to the application potential of MM Wave technology in various fields.

The next few years will be crucial for the MM wave industry as massive developments are expected to take place over the next seven years. In addition to this explosive growth in the number of players, mainly among component and product manufacturers and with migration of established players from RF and microwave is also expected.

MM Wave technology has found wide use and applications in three major fields – telecommunication, imaging and scanning, and RADAR. Due to the advanced and suitable features offered by MM Wave in mobile backhaul application, the telecommunication field will be a huge platform for MM Wave technology to grow. Imaging and scanning is the primary field responsible for commercial birth of MM Wave technology in a large scale, while RADAR field is still developing stage offering lots of space for MM Wave technology to penetrate.

In terms of life-cycle of the market, all the application fields for MM Wave are still in the initial stage and expected to take off in near future. MM wave market for telecommunication is expected to boom exponentially by 2015, in RADAR by 2016, while that in imaging and scanning had already taken off in early 2013.

The market is extremely patchy, in terms of frequency bands. Technically, commercial MM Wave equipment can be ranged anywhere between 8 GHz and 300 GHz. Of several spectrums, the ones that are expected to lead the market in terms of growth are 23-38 GHz, 38-43 GHz, 57-64 GHz, and the entire 70-95 GHz spectrum. In addition to this several novel frequency bands are also coming up which includes frequency bands between 95-120 GHz, 120-140 GHz and 140-300 GHz.

The main focus of the industry is on the light-licensed E-band, which consists of 71-76 GHz band, 81-86 GHz band, and 92-95 GHz band. All these bands can be used to deploy optimal MM wave products for the telecommunication,

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RADAR, and satellite communication applications.

For MM wave radios 81-86 GHz is the best choice in macro cell applications. Market for MM Wave products in this band is expected to grow at higher CAGR for the next seven years, among the entire light-licensed frequency spectrum MM Wave products. MM wave technology based products/ radios operating at 81-86 GHz band can largely replace Microwave technology based counterparts.

An alternative solution would be an unlicensed 57-64 GHz frequency spectrum, with a wide 7 GHz band for a broad-range of applications, though most optimal for small-cell mobile backhaul MM Wave products. With robust future ahead for small-cell equipment, MM Wave products operating in this band are expected to grab a major share of small-cell equipment market by 2020. Two major aspects of concern if this band is focused on would be, firstly the oxygen molecule resonance effect at 60 GHz, affecting the data transfer characteristics – a drawback only for this band. The other concern is that this band is also being focused by consumer digital media industry, for wireless media transfer at high data rates over short ranges, with several technologies coming up such as 60 GHz 802.11ad Wi-Fi and WiGig.

In future, mobile backhaul radios, transmission equipment, and enterprise and small-scale networking equipment will witness the highest growth, thus it would have large potential to be used widely in telecommunication for optimal service provisioning and deployment.

In terms of products, for the mobile and telecommunication field, choice of developing millimeter wave mobile backhaul radios, transmission equipment, and enterprise and small-scale networking equipment would be optimal for the next five years, as these products are forecast to have the highest growth and account for the major share.

For imaging and scanning field, MM Wave scanners, particularly MM Wave passive scanners rather than active, would be the best choice for scanning and security industry players to focus on investment in MM Wave technology. For companies established in other imaging and scanning technologies such as X-Ray back-scatter and UV imaging, shift of focus to passive MM Wave scanning technology at this point of time would prove to be beneficial in the long run. However, this product market is highly dependent on collaborations and partnerships in defense applications, and brand value, safety and security preferences in consumer applications.

The best choice for RADAR and communication system will be focused highly on

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application specific MM wave radar systems. In addition to this focus on customize solution such as Automotive RADAR, Marine RADAR, Military RADAR, or Aerospace RADAR would be act as a differentiator for the aspirant market leaders.

Coming to components for MM Wave equipment, the field is extremely fragmented, highly competitive, and offers relatively less revenue potential than that of MM Wave products. The MM Wave component market offers little scope for product differentiation too, neither in terms of specifications, nor in terms of technology. The market is expected to witness migration of established players from related industries such as RF and Microwave, further increasing the existing competition.

Coming to application sectors, for mobile and telecommunication sector, crucial players would be mobile-backhaul equipment manufacturers. While shifting to MM Wave technology, either light-licensed band based macro-cell equipment, or unlicensed band based small-cell is a must, as MM Wave technology is expected to emerge as the new choice for mobile-backhaul in the telecommunication sector. Though flexibility exists in choice of frequency band, ample focus on data transfer characteristics, data handling capacity, cost and pricing features, industry relations with telecommunication OEM giants (leading cellular service providers, specific to any region) is advisable to stay ahead in the race that’s about to begin.

Airport scanning and security applications having a huge revenue potential in the consumer application sector; however, waiting time for return on investment is too high. Other application such as commercial building and event security, perimeter and surveillance RADAR for institutional applications and wireless sensor networking in building and home automation can be good option for investment; however, market size of these applications are relatively smaller than that of airport scanning and security.

For military, defense and aerospace sector, the best choice for investment would be Military and Aerospace RADARs, followed by secure defense communication MM Wave equipment. Focus on the other emerging applications for MM Wave, such as satellite communication, healthcare imaging and scanning is also advisable, as they provide an added advantage of very low or little competition in the current scenario, leaving ample market space to occupy and emerge as a market leader in a niche field by the end of the decade.

U.S. and Western European region will be the most impacting region on the global MM wave market. Looking at APAC region China, Japan, South Korea, and India will play major role for telecommunication, and imaging and scanning applications

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