

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

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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

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

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:

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.

Contents

1 INTRODUCTION

- 1.1 STUDY OBJECTIVES
- 1.2 MARKET DEFINITION
 - 1.2.1 INCLUSIONS AND EXCLUSIONS
- 1.3 MARKET SCOPE
 - 1.3.1 MARKETS COVERED
 - 1.3.2 REGIONAL SCOPE
 - 1.3.3 YEARS CONSIDERED
- 1.4 CURRENCY CONSIDERED
- 1.5 STAKEHOLDERS
- 1.6 SUMMARY OF CHANGES
 - 1.6.1 RECESSION IMPACT

2 RESEARCH METHODOLOGY

- 2.1 RESEARCH DATA
 - FIGURE 1 MILLIMETER WAVE TECHNOLOGY MARKET: RESEARCH DESIGN
 - 2.1.1 SECONDARY DATA
 - 2.1.1.1 Key secondary sources
 - 2.1.1.2 Key data from secondary sources
 - 2.1.2 PRIMARY DATA
 - 2.1.2.1 Key primary sources
 - 2.1.2.2 Key data from primary sources
 - 2.1.2.3 Breakdown of primaries
 - 2.1.2.4 Insights from primaries
- 2.2 FACTOR ANALYSIS
 - 2.2.1 INTRODUCTION
 - 2.2.2 DEMAND-SIDE ANALYSIS
 - FIGURE 2 RESEARCH METHODOLOGY: MARKET SIZE ESTIMATION APPROACH
 - FIGURE 3 MARKET SIZE ESTIMATION METHODOLOGY USING REVENUE OF MARKET PLAYERS
 - 2.2.3 SUPPLY-SIDE ANALYSIS
 - FIGURE 4 MARKET SIZE ESTIMATION METHODOLOGY: BOTTOM-UP APPROACH, BY TYPE
- 2.3 MARKET SIZE ESTIMATION
 - 2.3.1 BOTTOM-UP APPROACH

2.3.1.1 Approach to derive market size using bottom-up analysis

FIGURE 5 MILLIMETER WAVE TECHNOLOGY MARKET: BOTTOM-UP APPROACH

2.3.2 TOP-DOWN APPROACH

2.3.2.1 Approach to derive market size using top-down analysis

FIGURE 6 MARKET SIZE ESTIMATION METHODOLOGY: TOP-DOWN APPROACH

2.4 MARKET BREAKDOWN AND DATA TRIANGULATION

FIGURE 7 DATA TRIANGULATION

2.5 ASSUMPTIONS

2.5.1 FORECASTING ASSUMPTIONS

2.5.2 GROWTH RATE ASSUMPTIONS

2.5.3 RESEARCH ASSUMPTIONS

2.6 LIMITATIONS

2.7 RISK ASSESSMENT

2.8 RECESSION IMPACT

3 EXECUTIVE SUMMARY

TABLE 1 GLOBAL MILLIMETER WAVE TECHNOLOGY MARKET, 2019–2028

FIGURE 8 GDP GROWTH PROJECTION TILL 2023 FOR MAJOR ECONOMIES

FIGURE 9 TELECOMMUNICATION EQUIPMENT SEGMENT TO LEAD MILLIMETER WAVE TECHNOLOGY MARKET DURING FORECAST PERIOD

FIGURE 10 FULLY LICENSED SEGMENT TO ACCOUNT FOR LARGEST SHARE OF MILLIMETER WAVE TECHNOLOGY MARKET BY 2028

FIGURE 11 57–95 GHZ SEGMENT TO HOLD LARGEST MARKET SHARE DURING FORECAST PERIOD

FIGURE 12 FREQUENCY SOURCES & RELATED COMPONENTS SEGMENT TO HOLD LARGEST MARKET SHARE DURING FORECAST PERIOD

FIGURE 13 MOBILE & TELECOMMUNICATION SEGMENT TO DOMINATE MILLIMETER WAVE TECHNOLOGY MARKET DURING FORECAST PERIOD

FIGURE 14 NORTH AMERICA TO ACCOUNT FOR LARGEST SHARE OF MILLIMETER WAVE TECHNOLOGY MARKET BY 2028

4 PREMIUM INSIGHTS

4.1 ATTRACTIVE OPPORTUNITIES FOR PLAYERS IN MILLIMETER WAVE TECHNOLOGY MARKET

FIGURE 15 INCREASING USE OF MILLIMETER WAVE TECHNOLOGY IN VARIOUS INDUSTRIES AND SECTORS

4.2 MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT

FIGURE 16 TELECOMMUNICATION EQUIPMENT SEGMENT TO LEAD MILLIMETER WAVE TECHNOLOGY MARKET DURING FORECAST PERIOD

4.3 MILLIMETER WAVE TECHNOLOGY MARKET, BY LICENSE TYPE

FIGURE 17 FULLY LICENSED SEGMENT TO HOLD LARGEST SHARE OF MILLIMETER WAVE TECHNOLOGY MARKET DURING FORECAST PERIOD

4.4 NORTH AMERICAN MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE AND COUNTRY

FIGURE 18 MOBILE & TELECOMMUNICATION SEGMENT AND US TO HOLD LARGEST SHARES OF NORTH AMERICAN MILLIMETER WAVE TECHNOLOGY MARKET IN 2028

4.5 MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY

FIGURE 19 ASIA PACIFIC TO REGISTER HIGHEST CAGR IN MILLIMETER WAVE TECHNOLOGY MARKET DURING FORECAST PERIOD

5 MARKET OVERVIEW

5.1 INTRODUCTION

5.2 MARKET DYNAMICS

FIGURE 20 MILLIMETER WAVE TECHNOLOGY MARKET: DRIVERS, RESTRAINTS, OPPORTUNITIES, AND CHALLENGES

5.2.1 DRIVERS

FIGURE 21 MILLIMETER WAVE TECHNOLOGY MARKET: DRIVERS AND THEIR IMPACT

5.2.1.1 Increase in broadband and mobile speeds

FIGURE 22 FIXED BROADBAND SPEEDS

FIGURE 23 MOBILE (CELLULAR) SPEEDS

5.2.1.2 Rising use of millimeter wave technology in small-cell backhaul networks

FIGURE 24 GLOBAL MOBILE DATA TRAFFIC (PER MONTH)

5.2.1.3 High demand for millimeter wave technology in security and radar applications

TABLE 2 MILLIMETER WAVE FREQUENCIES AND APPLICATIONS

5.2.1.4 Growing need for faster data transmission

TABLE 3 DEVELOPMENTS IN 60 GHZ FWA SOLUTIONS

5.2.2 RESTRAINTS

FIGURE 25 MILLIMETER WAVE TECHNOLOGY MARKET: RESTRAINTS AND THEIR IMPACT

5.2.2.1 Low penetration power and adverse impact on environment

5.2.3 OPPORTUNITIES

FIGURE 26 MILLIMETER WAVE TECHNOLOGY MARKET: OPPORTUNITIES AND

THEIR IMPACT

5.2.3.1 Surging use of 5G and millimeter wave technologies

FIGURE 27 GLOBAL NUMBER OF 5G SUBSCRIBERS, 2020–2028 (MILLION)

5.2.3.2 Emergence of new applications in aerospace & defense industry

5.2.3.3 Emergence of autonomous vehicles

5.2.3.4 Rising number of Internet of Things (IoT)-based devices

FIGURE 28 NUMBER OF IOT DEVICES, 2020–2028 (BILLION UNITS)

5.2.3.5 Rising use of V-band millimeter waves for last-mile connectivity

5.2.4 CHALLENGES

FIGURE 29 MILLIMETER WAVE TECHNOLOGY MARKET: CHALLENGES AND THEIR IMPACT

5.2.4.1 Challenges associated with physical properties of millimeter waves

TABLE 4 CHALLENGES ASSOCIATED WITH PHYSICAL PARAMETERS OF MILLIMETER WAVES

5.3 TRENDS/DISRUPTIONS IMPACTING CUSTOMERS' BUSINESSES

FIGURE 30 REVENUE SHIFT FOR MILLIMETER WAVE TECHNOLOGY MARKET PLAYERS

5.4 AVERAGE SELLING PRICE (ASP) ANALYSIS

5.4.1 AVERAGE SELLING PRICE OF PRODUCTS OFFERED BY KEY PLAYERS

FIGURE 31 AVERAGE SELLING PRICE OF PRODUCTS OFFERED BY THREE KEY PLAYERS

TABLE 5 AVERAGE SELLING PRICE OF PRODUCTS OFFERED BY THREE KEY PLAYERS (USD)

TABLE 6 KEY PROVIDERS OF MILLIMETER WAVE TELECOMMUNICATION PRODUCTS

TABLE 7 KEY PROVIDERS OF MILLIMETER WAVE SCANNING PRODUCTS

TABLE 8 KEY PROVIDERS OF MILLIMETER WAVE RADAR AND SATELLITE PRODUCTS

5.5 VALUE CHAIN ANALYSIS

FIGURE 32 MILLIMETER WAVE TECHNOLOGY MARKET: VALUE CHAIN ANALYSIS

5.5.1 RESEARCH AND PRODUCT DEVELOPMENT

5.5.2 MANUFACTURING

5.5.3 PRODUCT DISTRIBUTION

5.5.4 SYSTEM INTEGRATORS

5.5.5 END USE

5.6 ECOSYSTEM ANALYSIS

FIGURE 33 KEY PARTICIPANTS IN MILLIMETER WAVE TECHNOLOGY ECOSYSTEM

TABLE 9 MILLIMETER WAVE TECHNOLOGY MARKET: ECOSYSTEM ANALYSIS

5.7 TECHNOLOGY ANALYSIS

5.7.1 MILLIMETER WAVE TECHNOLOGY

5.7.2 TERAHERTZ WAVES

TABLE 10 MILLIMETER WAVE TECHNOLOGY VS. TERAHERTZ WAVE TECHNOLOGY

5.8 PATENT ANALYSIS

FIGURE 34 PATENT ANALYSIS

TABLE 11 NOTICEABLE PATENTS RELATED TO MILLIMETER WAVE TECHNOLOGY

5.9 TRADE ANALYSIS

FIGURE 35 IMPORT DATA FOR HS CODE 851761 FOR TOP FIVE COUNTRIES IN MILLIMETER WAVE TECHNOLOGY MARKET, 2018–2022 (USD MILLION)

FIGURE 36 EXPORT DATA FOR HS CODE 851761 FOR TOP FIVE COUNTRIES IN MILLIMETER WAVE TECHNOLOGY MARKET, 2018–2022 (USD MILLION)

5.10 CASE STUDY ANALYSIS

5.10.1 TELECOMMUNICATION

5.10.1.1 Porsche Informatik connected campus buildings using LightPointe AireLink 60 SX system

5.10.1.2 Skycom1 relies on HaulPass V60s V-Band Wireless links

5.10.2 IMAGING

5.10.2.1 First-to-market radio-wave Breast Imaging System achieved with network analyzer

5.10.2.2 Memorial Sloan-Kettering Cancer Center found cure for network congestion with high-speed outdoor wireless links from LightPointe

5.10.3 AUTOMOTIVE & TRANSPORTATION

5.10.3.1 LightPointe connected buildings of Public Transportation Department in Washington State

5.10.3.2 Proxim Solutions enabled seamless surveillance along Tenerife Tram Line in Spain

5.10.4 INDUSTRIAL

5.10.4.1 High-capacity industrial wireless connectivity for ArcelorMittal

5.10.4.2 Kingston Technology deployed HaulPass V60s wireless broadband for disaster recovery and campus network expansion

5.10.5 CONSUMER & COMMERCIAL

5.10.5.1 Martin Agency deployed LightPointe Free Space Optics wireless bridge to connect buildings

5.10.5.2 City of Mission Viejo deployed cost-effective broadband wireless gigabit ethernet link at Potocki Conference Center

5.11 PORTER'S FIVE FORCES ANALYSIS

TABLE 12 MILLIMETER WAVE TECHNOLOGY MARKET: PORTER'S FIVE FORCES ANALYSIS

- 5.11.1 DEGREE OF COMPETITION
- 5.11.2 THREAT OF NEW ENTRANTS
- 5.11.3 THREAT OF SUBSTITUTES
- 5.11.4 BARGAINING POWER OF BUYERS
- 5.11.5 BARGAINING POWER OF SUPPLIERS

5.12 KEY CONFERENCES AND EVENTS, 2023–2024**TABLE 13 MILLIMETER WAVE TECHNOLOGY MARKET: CONFERENCES AND EVENTS****5.13 KEY STAKEHOLDERS AND BUYING CRITERIA**

- 5.13.1 KEY STAKEHOLDERS IN BUYING PROCESS

FIGURE 37 INFLUENCE OF STAKEHOLDERS ON BUYING PROCESS, BY TOP THREE END USES**TABLE 14 INFLUENCE OF STAKEHOLDERS ON BUYING PROCESS, BY TOP THREE END USES (%)**

- 5.13.2 BUYING CRITERIA

FIGURE 38 KEY BUYING CRITERIA FOR TOP THREE END USES**5.14 TARIFF AND REGULATORY LANDSCAPE**

- 5.14.1 TARIFFS

TABLE 15 TARIFFS FOR BASE STATIONS OF APPARATUS FOR TRANSMISSION OR RECEPTION OF VOICE, IMAGES, OR OTHER DATA EXPORTED BY CHINA**TABLE 16 TARIFFS FOR BASE STATIONS OF APPARATUS FOR TRANSMISSION OR RECEPTION OF VOICE, IMAGES, OR OTHER DATA EXPORTED BY HUNGARY****TABLE 17 TARIFFS FOR BASE STATIONS OF APPARATUS FOR TRANSMISSION OR RECEPTION OF VOICE, IMAGES, OR OTHER DATA EXPORTED BY VIETNAM****TABLE 18 TARIFFS FOR BASE STATIONS OF APPARATUS FOR TRANSMISSION OR RECEPTION OF VOICE, IMAGES, OR OTHER DATA EXPORTED BY SWEDEN****TABLE 19 TARIFFS FOR BASE STATIONS OF APPARATUS FOR TRANSMISSION OR RECEPTION OF VOICE, IMAGES, OR OTHER DATA EXPORTED BY US**

- 5.14.2 REGULATIONS

6 SOFTWARE AND SERVICES ASSOCIATED WITH MILLIMETER WAVE TECHNOLOGY**6.1 SOFTWARE****6.2 SERVICES****6.3 DESIGNING AND CONSULTING**

- 6.3.1 INTEGRATION AND DEPLOYMENT

6.3.2 SUPPORT AND MAINTENANCE

7 MILLIMETER WAVE TECHNOLOGY IN MOBILE AND WIRELESS BACKHAUL

7.1 MOBILE AND WIRELESS BACKHAUL

8 MILLIMETER WAVE TECHNOLOGY MARKET, BY COMPONENT

8.1 INTRODUCTION

8.2 MARKET SIZE ESTIMATION FOR COMPONENT SEGMENTS

FIGURE 39 ANTENNA & TRANSCEIVER COMPONENTS SEGMENT TO REGISTER HIGHEST CAGR IN MILLIMETER WAVE TECHNOLOGY MARKET DURING FORECAST PERIOD

TABLE 20 MILLIMETER WAVE TECHNOLOGY MARKET, BY COMPONENT, 2019–2022 (USD MILLION)

TABLE 21 MILLIMETER WAVE TECHNOLOGY MARKET, BY COMPONENT, 2023–2028 (USD MILLION)

8.3 ANTENNA & TRANSCEIVER COMPONENTS

8.3.1 FUNCTIONING OF MILLIMETER WAVE-BASED EQUIPMENT HIGHLY AFFECTED BY ANTENNAS AND TRANSCEIVERS

TABLE 22 MAJOR PROVIDERS OF MILLIMETER WAVE ANTENNAS

8.4 FREQUENCY SOURCES & RELATED COMPONENTS

8.4.1 MAINLY OSCILLATOR SOURCE DEVICES THAT GENERATE MILLIMETER WAVES

8.5 COMMUNICATION & NETWORKING COMPONENTS

8.5.1 COMMUNICATION & NETWORKING COMPONENTS PLAY VITAL ROLE IN TELECOMMUNICATION

8.6 IMAGING COMPONENTS

8.6.1 IMAGING COMPONENTS FIND APPLICATIONS IN AUTOMOTIVE, MEDICAL, AND INDUSTRIAL INSPECTION

8.7 RF & RADIO COMPONENTS

8.7.1 USED IN MILLIMETER WAVE RADIOS FOR SMALL-CELL BACKHAUL APPLICATIONS

8.8 SENSORS & CONTROLS

8.8.1 USED IN MILLIMETER WAVE SCANNERS

8.9 INTERFACE COMPONENTS

8.9.1 MAINLY INCLUDE INPUT AND OUTPUT CONTROLS

8.10 POWER & BATTERY COMPONENTS

8.10.1 MILLIMETER WAVE TECHNOLOGY PLAYS IMPORTANT ROLE IN

IMPLEMENTING WIRELESS POWER TRANSFER TECHNOLOGY

8.11 OTHERS

9 MILLIMETER WAVE TECHNOLOGY MARKET, BY FREQUENCY BAND

9.1 INTRODUCTION

FIGURE 40 57–86 GHZ SEGMENT TO REGISTER HIGHEST CAGR IN MILLIMETER WAVE TECHNOLOGY MARKET DURING FORECAST PERIOD

TABLE 23 MILLIMETER WAVE TECHNOLOGY MARKET, BY FREQUENCY BAND, 2019–2022 (USD MILLION)

TABLE 24 MILLIMETER WAVE TECHNOLOGY MARKET, BY FREQUENCY BAND, 2023–2028 (USD MILLION)

FIGURE 41 AVERAGE PRICE PER FREQUENCY BAND (GHZ) IN 2022 (USD)

9.2 24–57 GHZ

9.2.1 INCREASING USE OF MILLIMETER WAVES WITH FREQUENCY BANDS BETWEEN 24 AND 57 GHZ IN TELECOMMUNICATIONS INDUSTRY

9.3 57–95 GHZ

9.3.1 INCREASING APPLICATIONS OF MILLIMETER WAVES WITH FREQUENCY BANDS BETWEEN 57 AND 86 GHZ IN AUTOMOTIVE, HEALTHCARE, AND TELECOMMUNICATIONS INDUSTRIES

TABLE 25 CHARACTERISTICS OF V-BAND AND E-BAND

9.3.2 V-BAND

9.3.3 E-BAND

9.4 95–300 GHZ

9.4.1 RISING USE OF MILLIMETER WAVES WITH FREQUENCY BANDS BETWEEN 95 AND 300 GHZ FOR TELECOMMUNICATION IN AEROSPACE & DEFENSE INDUSTRY

10 MILLIMETER WAVE TECHNOLOGY MARKET, BY LICENSE TYPE

10.1 INTRODUCTION

FIGURE 42 UNLICENSED SEGMENT TO REGISTER HIGHEST CAGR IN MILLIMETER WAVE TECHNOLOGY MARKET DURING FORECAST PERIOD

TABLE 26 MILLIMETER WAVE TECHNOLOGY MARKET, BY LICENSE TYPE, 2019–2022 (USD MILLION)

TABLE 27 MILLIMETER WAVE TECHNOLOGY MARKET, BY LICENSE TYPE, 2023–2028 (USD MILLION)

10.2 LIGHT LICENSED

10.2.1 ENABLES POINT-TO-POINT WIRELESS COMMUNICATION

10.3 UNLICENSED

10.3.1 UNAFFECTED BY WIND OR SUNLIGHT

10.4 FULLY LICENSED

10.4.1 WIDELY ADOPTED IN TELECOMMUNICATIONS INDUSTRY

11 MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT

11.1 INTRODUCTION

FIGURE 43 TELECOMMUNICATION EQUIPMENT SEGMENT TO REGISTER HIGHEST CAGR IN MILLIMETER WAVE TECHNOLOGY MARKET DURING FORECAST PERIOD

TABLE 28 MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2019–2022 (USD MILLION)

TABLE 29 MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2023–2028 (USD MILLION)

TABLE 30 MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2019–2022 (THOUSAND UNITS)

TABLE 31 MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2023–2028 (THOUSAND UNITS)

11.2 SCANNING SYSTEMS

TABLE 32 SCANNING SYSTEMS: MILLIMETER WAVE TECHNOLOGY MARKET, BY TYPE, 2019–2022 (USD MILLION)

TABLE 33 SCANNING SYSTEMS: MILLIMETER WAVE TECHNOLOGY MARKET, BY TYPE, 2023–2028 (USD MILLION)

TABLE 34 SCANNING SYSTEMS: NORTH AMERICA MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 35 SCANNING SYSTEMS: NORTH AMERICA MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 36 SCANNING SYSTEMS: EUROPE MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 37 SCANNING SYSTEMS: EUROPE MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 38 SCANNING SYSTEMS: ASIA PACIFIC MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 39 SCANNING SYSTEMS: ASIA PACIFIC MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 40 SCANNER SYSTEMS: ROW MILLIMETER WAVE TECHNOLOGY MARKET, BY REGION, 2019–2022 (USD MILLION)

TABLE 41 SCANNER SYSTEMS: ROW MILLIMETER WAVE TECHNOLOGY

MARKET, BY REGION, 2023–2028 (USD MILLION)

TABLE 42 SCANNING SYSTEMS: MILLIMETER WAVE TECHNOLOGY MARKET, BY COMPONENT, 2019–2022 (USD MILLION)

TABLE 43 SCANNER SYSTEMS: MILLIMETER WAVE TECHNOLOGY MARKET, BY COMPONENT, 2023–2028 (USD MILLION)

11.2.1 ACTIVE SCANNERS

11.2.1.1 Direct millimeter wave energy at subject and interpret reflected energy

11.2.2 PASSIVE SCANNERS

11.2.2.1 Generate images using ambient radiation and radiation discharged from human body or objects

11.3 RADAR & SATELLITE COMMUNICATION SYSTEMS

TABLE 44 RADAR & SATELLITE COMMUNICATION SYSTEMS: MILLIMETER WAVE TECHNOLOGY MARKET, BY TYPE, 2019–2022 (USD MILLION)

TABLE 45 RADAR & SATELLITE COMMUNICATION SYSTEMS: MILLIMETER WAVE TECHNOLOGY MARKET, BY TYPE, 2023–2028 (USD MILLION)

TABLE 46 RADAR & SATELLITE COMMUNICATION SYSTEMS: NORTH AMERICA MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 47 RADAR & SATELLITE COMMUNICATION SYSTEMS: NORTH AMERICA MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 48 RADAR & SATELLITE COMMUNICATION SYSTEMS: EUROPE MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 49 RADAR & SATELLITE COMMUNICATION SYSTEMS: EUROPE MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 50 RADAR & SATELLITE COMMUNICATION SYSTEMS: ASIA PACIFIC MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 51 RADAR & SATELLITE COMMUNICATION SYSTEMS: ASIA PACIFIC MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 52 RADAR & SATELLITE COMMUNICATION SYSTEMS: ROW MILLIMETER WAVE TECHNOLOGY MARKET, BY REGION, 2019–2022 (USD MILLION)

TABLE 53 RADAR & SATELLITE COMMUNICATION SYSTEMS: ROW MILLIMETER WAVE TECHNOLOGY MARKET, BY REGION, 2023–2028 (USD MILLION)

TABLE 54 RADAR & SATELLITE COMMUNICATION SYSTEMS: MILLIMETER WAVE TECHNOLOGY MARKET, BY COMPONENT, 2019–2022 (USD MILLION)

TABLE 55 RADAR & SATELLITE COMMUNICATION SYSTEMS: MILLIMETER WAVE TECHNOLOGY MARKET, BY COMPONENT, 2023–2028 (USD MILLION)**11.3.1 PERIMETER SURVEILLANCE RADAR SYSTEMS (PSRS)**

11.3.1.1 Used to monitor critical and highly secured areas

11.3.2 APPLICATION-SPECIFIC RADAR SYSTEMS

11.3.2.1 Used in automobile and defense applications

11.3.3 SATELLITE COMMUNICATION SYSTEMS

11.3.3.1 Incorporated mainly into repeaters for use in V-band and E-band

11.4 TELECOMMUNICATION EQUIPMENT**11.4.1 MOBILE BACKHAUL EQUIPMENT**

11.4.1.1 Refers to procedure of transmitting data to backbone network

11.4.2 SMALL-CELL EQUIPMENT

11.4.2.1 Uses unlicensed 60 GHz frequency band

11.4.3 MACROCELL EQUIPMENT

11.4.3.1 Used in wide outdoor coverage ranging from 3 to 5 km (1.8–3 miles)

TABLE 56 TELECOMMUNICATION EQUIPMENT: MILLIMETER WAVE TECHNOLOGY MARKET, BY TYPE, 2019–2022 (USD MILLION)**TABLE 57 TELECOMMUNICATION EQUIPMENT: MILLIMETER WAVE TECHNOLOGY MARKET, BY TYPE, 2023–2028 (USD MILLION)****TABLE 58 TELECOMMUNICATION EQUIPMENT: NORTH AMERICA MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)****TABLE 59 TELECOMMUNICATION EQUIPMENT: NORTH AMERICA MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)****TABLE 60 TELECOMMUNICATION EQUIPMENT: EUROPE MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)****TABLE 61 TELECOMMUNICATION EQUIPMENT: EUROPE MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)****TABLE 62 TELECOMMUNICATION EQUIPMENT: ASIA PACIFIC MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)****TABLE 63 TELECOMMUNICATION EQUIPMENT: ASIA PACIFIC MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)****TABLE 64 TELECOMMUNICATION EQUIPMENT: ROW MILLIMETER WAVE TECHNOLOGY MARKET, BY REGION, 2019–2022 (USD MILLION)****TABLE 65 TELECOMMUNICATION EQUIPMENT: ROW MILLIMETER WAVE TECHNOLOGY MARKET, BY REGION, 2023–2028 (USD MILLION)****TABLE 66 TELECOMMUNICATION EQUIPMENT: MILLIMETER WAVE TECHNOLOGY MARKET, BY COMPONENT, 2019–2022 (USD MILLION)****TABLE 67 TELECOMMUNICATION EQUIPMENT: MILLIMETER WAVE TECHNOLOGY MARKET, BY COMPONENT, 2023–2028 (USD MILLION)**

11.5 OTHERS

TABLE 68 OTHERS: NORTH AMERICA MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 69 OTHERS: NORTH AMERICA MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 70 OTHERS: EUROPE MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 71 OTHERS: EUROPE MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 72 OTHERS: ASIA PACIFIC MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 73 OTHERS: ASIA PACIFIC MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 74 OTHERS: ROW MILLIMETER WAVE TECHNOLOGY MARKET, BY REGION, 2019–2022 (USD MILLION)

TABLE 75 OTHERS: ROW MILLIMETER WAVE TECHNOLOGY MARKET, BY REGION, 2023–2028 (USD MILLION)

12 MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE

12.1 INTRODUCTION

FIGURE 44 MOBILE & TELECOMMUNICATION SEGMENT TO REGISTER HIGHEST CAGR IN MILLIMETER WAVE TECHNOLOGY MARKET DURING FORECAST PERIOD

TABLE 76 MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2019–2022 (USD MILLION)

TABLE 77 MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2023–2028 (USD MILLION)

12.2 MOBILE & TELECOMMUNICATION

12.2.1 ADVANCEMENTS IN 5G TECHNOLOGY

TABLE 78 MOBILE & TELECOMMUNICATION: NORTH AMERICA MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 79 MOBILE & TELECOMMUNICATION: NORTH AMERICA MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 80 MOBILE & TELECOMMUNICATION: EUROPE MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 81 MOBILE & TELECOMMUNICATION: EUROPE MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 82 MOBILE & TELECOMMUNICATION: ASIA PACIFIC MILLIMETER WAVE

TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 83 MOBILE & TELECOMMUNICATION: ASIA PACIFIC MILLIMETER WAVE

TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 84 MOBILE & TELECOMMUNICATION: ROW MILLIMETER WAVE

TECHNOLOGY MARKET, BY REGION, 2019–2022 (USD MILLION)

TABLE 85 MOBILE & TELECOMMUNICATION: ROW MILLIMETER WAVE

TECHNOLOGY MARKET, BY REGION, 2023–2028 (USD MILLION)

12.3 CONSUMER & COMMERCIAL

12.3.1 INCREASING USE OF MILLIMETER WAVE TECHNOLOGY IN WIRELESS SENSORS AND WIRELESS SECURITY APPLICATIONS

TABLE 86 CONSUMER & COMMERCIAL: NORTH AMERICA MILLIMETER WAVE

TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 87 CONSUMER & COMMERCIAL: NORTH AMERICA MILLIMETER WAVE

TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 88 CONSUMER & COMMERCIAL: EUROPE MILLIMETER WAVE

TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 89 CONSUMER & COMMERCIAL: EUROPE MILLIMETER WAVE

TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 90 CONSUMER & COMMERCIAL: ASIA PACIFIC MILLIMETER WAVE

TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 91 CONSUMER & COMMERCIAL: ASIA PACIFIC MILLIMETER WAVE

TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 92 CONSUMER & COMMERCIAL: ROW MILLIMETER WAVE TECHNOLOGY MARKET, BY REGION, 2019–2022 (USD MILLION)

TABLE 93 CONSUMER & COMMERCIAL: ROW MILLIMETER WAVE TECHNOLOGY MARKET, BY REGION, 2023–2028 (USD MILLION)

12.4 HEALTHCARE

12.4.1 RISING USE OF MILLIMETER WAVE TECHNOLOGY IN MEDICAL SCANNING AND IMAGING APPLICATIONS

TABLE 94 HEALTHCARE: NORTH AMERICA MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 95 HEALTHCARE: NORTH AMERICA MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 96 HEALTHCARE: EUROPE MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 97 HEALTHCARE: EUROPE MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 98 HEALTHCARE: ASIA PACIFIC MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 99 HEALTHCARE: ASIA PACIFIC MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 100 HEALTHCARE: ROW MILLIMETER WAVE TECHNOLOGY MARKET, BY REGION, 2019–2022 (USD MILLION)

TABLE 101 HEALTHCARE: ROW MILLIMETER WAVE TECHNOLOGY MARKET, BY REGION, 2023–2028 (USD MILLION)

12.5 INDUSTRIAL

12.5.1 GROWING ADOPTION OF MILLIMETER WAVE TECHNOLOGY FOR LEVEL MEASUREMENTS

TABLE 102 INDUSTRIAL: NORTH AMERICA MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 103 INDUSTRIAL: NORTH AMERICA MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 104 INDUSTRIAL: EUROPE MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 105 INDUSTRIAL: EUROPE MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 106 INDUSTRIAL: ASIA PACIFIC MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 107 INDUSTRIAL: ASIA PACIFIC MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 108 INDUSTRIAL: ROW MILLIMETER WAVE TECHNOLOGY MARKET, BY REGION, 2019–2022 (USD MILLION)

TABLE 109 INDUSTRIAL: ROW MILLIMETER WAVE TECHNOLOGY MARKET, BY REGION, 2023–2028 (USD MILLION)

12.6 AUTOMOTIVE & TRANSPORTATION

12.6.1 INCREASING INCORPORATION OF MILLIMETER WAVE RADARS INTO AUTONOMOUS VEHICLES

TABLE 110 AUTOMOTIVE & TRANSPORTATION: NORTH AMERICA MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 111 AUTOMOTIVE & TRANSPORTATION: NORTH AMERICA MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 112 AUTOMOTIVE & TRANSPORTATION: EUROPE MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 113 AUTOMOTIVE & TRANSPORTATION: EUROPE MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 114 AUTOMOTIVE & TRANSPORTATION: ASIA PACIFIC MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 115 AUTOMOTIVE & TRANSPORTATION: ASIA PACIFIC MILLIMETER

WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 116 AUTOMOTIVE & TRANSPORTATION: ROW MILLIMETER WAVE TECHNOLOGY MARKET, BY REGION, 2019–2022 (USD MILLION)

TABLE 117 AUTOMOTIVE & TRANSPORTATION: ROW MILLIMETER WAVE TECHNOLOGY MARKET, BY REGION, 2023–2028 (USD MILLION)

12.7 AEROSPACE & DEFENSE

12.7.1 RISING USE OF MILLIMETER WAVE TECHNOLOGY IN AIRCRAFT AND SATELLITES

TABLE 118 AEROSPACE & DEFENSE: NORTH AMERICA MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 119 AEROSPACE & DEFENSE: NORTH AMERICA MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 120 AEROSPACE & DEFENSE: EUROPE MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 121 AEROSPACE & DEFENSE: EUROPE MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 122 AEROSPACE & DEFENSE: ASIA PACIFIC MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 123 AEROSPACE & DEFENSE: ASIA PACIFIC MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 124 AEROSPACE & DEFENSE: ROW MILLIMETER WAVE TECHNOLOGY MARKET, BY REGION, 2019–2022 (USD MILLION)

TABLE 125 AEROSPACE & DEFENSE: ROW MILLIMETER WAVE TECHNOLOGY MARKET, BY REGION, 2023–2028 (USD MILLION)

12.8 IMAGING

12.8.1 RISING ADOPTION OF MILLIMETER WAVE-BASED IMAGING PRODUCTS AT AIRPORTS AND CONCERTS

TABLE 126 IMAGING: NORTH AMERICA MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 127 IMAGING: NORTH AMERICA MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 128 IMAGING: EUROPE MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 129 IMAGING: EUROPE MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 130 IMAGING: ASIA PACIFIC MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 131 IMAGING: ASIA PACIFIC MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 132 IMAGING: ROW MILLIMETER WAVE TECHNOLOGY MARKET, BY REGION, 2019–2022 (USD MILLION)

TABLE 133 IMAGING: ROW MILLIMETER WAVE TECHNOLOGY MARKET, BY REGION, 2023–2028 (USD MILLION)

13 MILLIMETER WAVE TECHNOLOGY MARKET, BY REGION

13.1 INTRODUCTION

FIGURE 45 NORTH AMERICA TO ACCOUNT FOR LARGEST SHARE OF MILLIMETER WAVE TECHNOLOGY MARKET FROM 2023 TO 2028

TABLE 134 MILLIMETER WAVE TECHNOLOGY MARKET, BY REGION, 2019–2022 (USD MILLION)

TABLE 135 MILLIMETER WAVE TECHNOLOGY MARKET, BY REGION, 2023–2028 (USD MILLION)

TABLE 136 MILLIMETER WAVE TECHNOLOGY MARKET, BY REGION, 2019–2022 (THOUSAND UNITS)

TABLE 137 MILLIMETER WAVE TECHNOLOGY MARKET, BY REGION, 2023–2028 (THOUSAND UNITS)

13.2 NORTH AMERICA

13.2.1 NORTH AMERICA: RECESSION IMPACT

FIGURE 46 NORTH AMERICA: SNAPSHOT OF MILLIMETER WAVE TECHNOLOGY MARKET

TABLE 138 NORTH AMERICA: MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 139 NORTH AMERICA: MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 140 NORTH AMERICA: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2019–2022 (USD MILLION)

TABLE 141 NORTH AMERICA: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2023–2028 (USD MILLION)

TABLE 142 NORTH AMERICA: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2019–2022 (USD MILLION)

TABLE 143 NORTH AMERICA: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2023–2028 (USD MILLION)

13.2.2 US

13.2.2.1 Large presence of key companies offering millimeter wave technology

TABLE 144 US: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2019–2022 (USD MILLION)

TABLE 145 US: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE,

2023–2028 (USD MILLION)

TABLE 146 US: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2019–2022 (USD MILLION)

TABLE 147 US: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2023–2028 (USD MILLION)

13.2.3 CANADA

13.2.3.1 Rise in number of 5G rollouts

TABLE 148 CANADA: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2019–2022 (USD MILLION)

TABLE 149 CANADA: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2023–2028 (USD MILLION)

TABLE 150 CANADA: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2019–2022 (USD MILLION)

TABLE 151 CANADA: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2023–2028 (USD MILLION)

13.2.4 MEXICO

13.2.4.1 Expanding telecommunications industry with rising adoption of 5G technology

TABLE 152 MEXICO: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2019–2022 (USD MILLION)

TABLE 153 MEXICO: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2023–2028 (USD MILLION)

TABLE 154 MEXICO: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2019–2022 (USD MILLION)

TABLE 155 MEXICO: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2023–2028 (USD MILLION)

13.3 EUROPE

13.3.1 EUROPE: RECESSION IMPACT

FIGURE 47 EUROPE: SNAPSHOT OF MILLIMETER WAVE TECHNOLOGY MARKET

TABLE 156 EUROPE: MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 157 EUROPE: MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 158 EUROPE: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2019–2022 (USD MILLION)

TABLE 159 EUROPE: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2023–2028 (USD MILLION)

TABLE 160 EUROPE: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2019–2022 (USD MILLION)

TABLE 161 EUROPE: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2023–2028 (USD MILLION)

13.3.2 UK

13.3.2.1 Increased government-led investments in telecommunications industry

TABLE 162 UK: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2019–2022 (USD MILLION)

TABLE 163 UK: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2023–2028 (USD MILLION)

TABLE 164 UK: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2019–2022 (USD MILLION)

TABLE 165 UK: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2023–2028 (USD MILLION)

13.3.3 GERMANY

13.3.3.1 Increased deployment of millimeter wave technology in various industries

TABLE 166 GERMANY: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2019–2022 (USD MILLION)

TABLE 167 GERMANY: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2023–2028 (USD MILLION)

TABLE 168 GERMANY: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2019–2022 (USD MILLION)

TABLE 169 GERMANY: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2023–2028 (USD MILLION)

13.3.4 FRANCE

13.3.4.1 Technological shift from 4G to 5G

TABLE 170 FRANCE: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2019–2022 (USD MILLION)

TABLE 171 FRANCE: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2023–2028 (USD MILLION)

TABLE 172 FRANCE: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2019–2022 (USD MILLION)

TABLE 173 FRANCE: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2023–2028 (USD MILLION)

13.3.5 REST OF EUROPE

TABLE 174 REST OF EUROPE: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2019–2022 (USD MILLION)

TABLE 175 REST OF EUROPE: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2023–2028 (USD MILLION)

TABLE 176 REST OF EUROPE: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2019–2022 (USD MILLION)

TABLE 177 REST OF EUROPE: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2023–2028 (USD MILLION)

13.4 ASIA PACIFIC

13.4.1 ASIA PACIFIC: RECESSION IMPACT

FIGURE 48 ASIA PACIFIC: SNAPSHOT OF MILLIMETER WAVE TECHNOLOGY MARKET

TABLE 178 ASIA PACIFIC: MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2019–2022 (USD MILLION)

TABLE 179 ASIA PACIFIC: MILLIMETER WAVE TECHNOLOGY MARKET, BY COUNTRY, 2023–2028 (USD MILLION)

TABLE 180 ASIA PACIFIC: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2019–2022 (USD MILLION)

TABLE 181 ASIA PACIFIC: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2023–2028 (USD MILLION)

TABLE 182 ASIA PACIFIC: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2019–2022 (USD MILLION)

TABLE 183 ASIA PACIFIC: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2023–2028 (USD MILLION)

13.4.2 CHINA

13.4.2.1 Large customer base of telecommunication services

TABLE 184 CHINA: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2019–2022 (USD MILLION)

TABLE 185 CHINA: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2023–2028 (USD MILLION)

TABLE 186 CHINA: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2019–2022 (USD MILLION)

TABLE 187 CHINA: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2023–2028 (USD MILLION)

13.4.3 JAPAN

13.4.3.1 Expanding mobile & telecommunications and automotive industries

TABLE 188 JAPAN: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2019–2022 (USD MILLION)

TABLE 189 JAPAN: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2023–2028 (USD MILLION)

TABLE 190 JAPAN: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2019–2022 (USD MILLION)

TABLE 191 JAPAN: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2023–2028 (USD MILLION)

13.4.4 SOUTH KOREA

13.4.4.1 Presence of strong telecommunication infrastructure and easy availability of 5G mobile phones

TABLE 192 SOUTH KOREA: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2019–2022 (USD MILLION)

TABLE 193 SOUTH KOREA: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2023–2028 (USD MILLION)

TABLE 194 SOUTH KOREA: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2019–2022 (USD MILLION)

TABLE 195 SOUTH KOREA: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2023–2028 (USD MILLION)

13.4.5 INDIA

13.4.5.1 Increasing investments in 5G infrastructure and rise in number of 5G mobile phone manufacturers

TABLE 196 INDIA: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2019–2022 (USD MILLION)

TABLE 197 INDIA: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2023–2028 (USD MILLION)

TABLE 198 INDIA: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2019–2022 (USD MILLION)

TABLE 199 INDIA: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2023–2028 (USD MILLION)

13.4.6 REST OF ASIA PACIFIC

TABLE 200 REST OF ASIA PACIFIC: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2019–2022 (USD MILLION)

TABLE 201 REST OF ASIA PACIFIC: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2023–2028 (USD MILLION)

TABLE 202 REST OF ASIA PACIFIC: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2019–2022 (USD MILLION)

TABLE 203 REST OF ASIA PACIFIC: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2023–2028 (USD MILLION)

13.5 ROW

13.5.1 ROW: RECESSION IMPACT

TABLE 204 ROW: MILLIMETER WAVE TECHNOLOGY MARKET, BY REGION, 2019–2022 (USD MILLION)

TABLE 205 ROW: MILLIMETER WAVE TECHNOLOGY MARKET, BY REGION, 2023–2028 (USD MILLION)

TABLE 206 ROW: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2019–2022 (USD MILLION)

TABLE 207 ROW: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE,

2023–2028 (USD MILLION)

TABLE 208 ROW: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2019–2022 (USD MILLION)

TABLE 209 ROW: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2023–2028 (USD MILLION)

13.5.2 MIDDLE EAST & AFRICA

13.5.2.1 Increased adoption of millimeter wave technology in industrial sector and aerospace & defense and telecommunications industries

TABLE 210 MIDDLE EAST & AFRICA: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2019–2022 (USD MILLION)

TABLE 211 MIDDLE EAST & AFRICA: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2023–2028 (USD MILLION)

TABLE 212 MIDDLE EAST & AFRICA: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2019–2022 (USD MILLION)

TABLE 213 MIDDLE EAST & AFRICA: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2023–2028 (USD MILLION)

13.5.3 SOUTH AMERICA

13.5.3.1 Rising 5G deployments and partnerships of local players with global players

TABLE 214 SOUTH AMERICA: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2019–2022 (USD MILLION)

TABLE 215 SOUTH AMERICA: MILLIMETER WAVE TECHNOLOGY MARKET, BY END USE, 2023–2028 (USD MILLION)

TABLE 216 SOUTH AMERICA: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2019–2022 (USD MILLION)

TABLE 217 SOUTH AMERICA: MILLIMETER WAVE TECHNOLOGY MARKET, BY PRODUCT, 2023–2028 (USD MILLION)

14 COMPETITIVE LANDSCAPE

14.1 OVERVIEW

14.2 KEY STRATEGIES ADOPTED BY MAJOR MARKET PLAYERS

TABLE 218 OVERVIEW OF STRATEGIES ADOPTED BY KEY MILLIMETER WAVE TECHNOLOGY PROVIDERS

14.3 REVENUE ANALYSIS

FIGURE 49 REVENUE ANALYSIS OF KEY COMPANIES IN PAST FIVE YEARS

14.4 MARKET SHARE ANALYSIS, 2022

TABLE 219 MILLIMETER WAVE TECHNOLOGY MARKET: DEGREE OF COMPETITION

14.5 COMPANY EVALUATION QUADRANT

14.5.1 STARS

14.5.2 PERVASIVE PLAYERS

14.5.3 EMERGING LEADERS

14.5.4 PARTICIPANTS

FIGURE 50 MILLIMETER WAVE TECHNOLOGY MARKET (GLOBAL): COMPANY EVALUATION QUADRANT, 2022

14.6 COMPETITIVE BENCHMARKING (25 COMPANIES)

TABLE 220 END USE: COMPANY FOOTPRINT

TABLE 221 PRODUCT: COMPANY FOOTPRINT

TABLE 222 REGION: COMPANY FOOTPRINT

14.7 STARTUP/SME EVALUATION QUADRANT

14.7.1 PROGRESSIVE COMPANIES

14.7.2 RESPONSIVE COMPANIES

14.7.3 DYNAMIC COMPANIES

14.7.4 STARTING BLOCKS

FIGURE 51 MILLIMETER WAVE TECHNOLOGY MARKET: STARTUP/SME EVALUATION QUADRANT, 2022

14.8 COMPETITIVE SCENARIO AND TRENDS

14.8.1 PRODUCT LAUNCHES

TABLE 223 MILLIMETER WAVE TECHNOLOGY MARKET: PRODUCT LAUNCHES, JANUARY 2020–MARCH 2023

14.8.2 DEALS

TABLE 224 MILLIMETER WAVE TECHNOLOGY MARKET: DEALS, JANUARY 2020–MARCH 2023

15 COMPANY PROFILES

(Business Overview, Products/Solutions/Services Offered, Recent Developments, MnM view (Key strengths/Right to win, Strategic choices made, Weakness/competitive threats)*

15.1 INTRODUCTION

15.2 KEY PLAYERS

15.2.1 AXXCSS WIRELESS SOLUTIONS

TABLE 225 AXXCSS WIRELESS SOLUTIONS: COMPANY OVERVIEW

15.2.2 NEC CORPORATION

TABLE 226 NEC CORPORATION: COMPANY OVERVIEW

FIGURE 52 NEC CORPORATION: COMPANY SNAPSHOT

15.2.3 SIKLU COMMUNICATION

TABLE 227 SIKLU COMMUNICATION: COMPANY OVERVIEW

15.2.4 L3HARRIS

TABLE 228 L3HARRIS: COMPANY OVERVIEW

FIGURE 53 L3HARRIS TECHNOLOGIES: COMPANY SNAPSHOT

15.2.5 SMITHS GROUP PLC

TABLE 229 SMITHS GROUP: COMPANY OVERVIEW

FIGURE 54 SMITHS GROUP PLC: COMPANY SNAPSHOT

15.2.6 ERAVANT (FORMERLY SAGE MILLIMETER)

TABLE 230 ERAVANT: COMPANY OVERVIEW

15.2.7 AVIAT NETWORKS

TABLE 231 AVIAT NETWORKS: COMPANY OVERVIEW

FIGURE 55 AVIAT NETWORKS: COMPANY SNAPSHOT

15.2.8 FARRAN TECHNOLOGY

TABLE 232 FARRAN TECHNOLOGY: COMPANY OVERVIEW

15.2.9 MILLIMETER WAVE PRODUCTS INC.

TABLE 233 MILLIMETER WAVE PRODUCTS: COMPANY OVERVIEW

15.2.10 KEYSIGHT TECHNOLOGIES, INC.

TABLE 234 KEYSIGHT TECHNOLOGIES: COMPANY OVERVIEW

FIGURE 56 KEYSIGHT TECHNOLOGIES: COMPANY SNAPSHOT

15.3 OTHER PLAYERS

15.3.1 VUBIQ NETWORKS, INC.

15.3.2 ELVA-1

15.3.3 VERANA NETWORKS

15.3.4 CABLEFREE

15.3.5 FASTBACK NETWORKS

15.3.6 QUINSTAR TECHNOLOGY

15.3.7 LIGHTPOINTE COMMUNICATIONS, INC. (LIGHTPOINTE WIRELESS)

15.3.8 TREX ENTERPRISES CORPORATION (TREX)

15.3.9 NUCTECH

15.3.10 KYOCERA

15.3.11 RADWIN

15.3.12 IGNITENET

15.3.13 KRATOS DEFENSE & SECURITY SOLUTIONS

15.3.14 ANOKIWAVE

15.3.15 SPACEK LABS

15.3.16 CAMBIUM NETWORKS

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.

16 APPENDIX

16.1 DISCUSSION GUIDE

16.2 KNOWLEDGESTORE: MARKETSANDMARKETS' SUBSCRIPTION PORTAL

16.3 CUSTOMIZATION OPTIONS

16.4 RELATED REPORTS

16.5 AUTHOR DETAILS

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,

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

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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